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Original Articles.

PROSTATISM.*

BY EDWARD L. KEYES, JR., M.D., NEW YORK.

PROSTATISM is the best word I know to express that condition which results from obstruction to urination at the bladder neck due to adenomatous or sclerotic changes in the glands of the prostate itself, or of the posterior urethra. This description may seem unduly complex to you, but there is even today no absolute and general agreement as to the precise nature and origin of the so-called prostatic hypertrophy or sclerosis which are the two causes of prostatism. Prostatic adenoma, commonly known as hypertrophy, is an adenomatous change affecting various groups of glands about the bladder neck, some of them part of the prostate proper, and some of them small glands lying along the posterior urethra. As a result the prostate enlarges, protruding somewhat toward the rectum, but chiefly toward the bladder into which it projects, generally speaking, in the form of lateral or so-called median lobes or all together as a sort of horse-collar enlargement. The urethra is thus

lengthened and distorted, so that the effort to pass water closes the urethra instead of opening it. Hence the retention, acute or chronic, complete or incomplete, which is the basis of the disease.

The same phenomena of retention result from prostatic sclerosis. The sclerotic prostate may or may not also show adenomatous changes. It is usually but slightly enlarged, it is characteristically a rigid scarred prostate. This condition is appreciated when the surgeon performs a suprapubic section, and introduces his finger into the posterior urethra for the purpose of enucleating the adenomatous portions of the gland. The finger may not enter the posterior urethra at all without tearing this which has been changed into a sclerotic ring. Once in the urethra the mucous membrane tears with considerable difficulty, and the finger finds great difficulty in identifying any plane for the enucleation of lateral or median lobes.

This sclerotic prostatitis may occur at any age after adult life has been reached. I have seen it in men in the twenties, though it is commonest between the ages of 50 and 65. This sclerotic process may result from antecedent gonorrhea of considerable severity, or from bladder stone, or its cause may not appear. The effort to associate adenomatous prostatism

* Read at a meeting of the Surgical Section of the Suffolk District Medical Society, Nov. 21, 1919.

with gonorrhea has completely failed. Cabot and I have independently made observations which show that patients with stricture of the urethra are singularly free in their later lives from the symptoms and signs of adenoma of the prostate. Young has noted the rarity of this condition in Catholic priests, and its frequency in married men. I have been struck by these same facts, but beyond this the etiology of prostatism is open for discussion. Adenoma of the prostate, be it said, shows itself to the pathologist at about the fifth decade of life, but usually does not cause symptoms which persuade the victim to consult a physician until some twenty years later, usually when he is about sixty-five years of age.

Let us assume a working knowledge of the symptoms of prostatism and of the pathological processes which it implies, processes of dilatation and secondary infection of the bladder, the ureters and the kidneys. And let us turn our attention at once to some high lights in the diagnosis of this condition.

Retention of urine in the absence of grave ureteral stricture or of such obvious conditions as abscess in the prostate, stone in the urethra or periurethritis may be due to a number of causes. Let us enumerate them in order of frequency:

1. Adenoma of the prostate.
2. Carcinoma of the prostate.
3. Tabes.
4. Sclerosis of the prostate.
5. Diverticulum of the bladder.
6. Tumor or stone of the bladder.
7. Prostatic stone.

The differential diagnosis between these various conditions is by no means always easy, though sometimes it is obvious enough. Yet it is always confused by the fact that several among them may exist together. Any specialist will recall cases in which adenoma of the prostate has been associated with carcinoma, with tabes, with prostatic stone, with bladder stone, diverticulum or tumor. Thus the differential diagnosis implies, not only the proof that one of these conditions does exist, but that all of the others do or do not exist. So complete a diagnosis is perhaps not always essential to the general practitioner; it certainly is to the specialist.

In the first place one must define retention of urine. This is usually described as a con-

dition in which at least 50 c.c. of urine may be drawn from the bladder by catheter immediately after the patient urinates. Such a definition will suffice in general, but there are a number of functional conditions, notably the diurnal polyuria familiarly but incorrectly labelled hysterical, and the nocturnal polyuria which is often an indication of deficient vitality in a person suffering from chronic nephritis or arterio-sclerosis. There are a number of such polyuric conditions which are not infrequently met with in middle life, and which give symptoms resembling those of prostatism. But their cause is an increased production of urine, not a retention. Let such a patient urinate, then talk with him a few minutes while he is removing his coat, then catheterize him and you may get as much as 200 c.c. from the bladder though the lower urinary organs are actually quite normal and this great quantity of urine has been manufactured within a short time. Let it be understood, therefore, that a single observation of a small amount of residual urine does not establish the diagnosis of prostatism unless supported by many other data.

To enumerate all of the differentiating points between the several conditions that cause or simulate prostatism would but confuse you. Let us rather touch upon the more striking features of each.

Prostatic Adenoma. Prostatic adenoma causes the symptoms of prostatism which bring a patient to consult a physician when he is over fifty-five and not more than seventy years of age. Examination reveals retention of urine and rectal touch usually discloses a bilateral symmetrical enlargement of the prostate in all of its dimensions. Exceptionally the adenoma is at the bladder neck and the prostate feels normal by rectal touch. If a sound or cystoscope is introduced into the urethra this will be felt plainly through the apex of the prostate, while the base of the prostate forms more or less of a mass between the finger in the rectum and the instrument. Inspection of the prostate through the cystoscope reveals a bulging within the bladder quite comparable to the bulging felt by rectum. The demarkation between the lobes is identified by deep clefts in the bladder neck for which Young has devised an ingenious chart. The extent of projection into the bladder is estimated by the degree to which the trigone is obscured.

Carcinoma of the Prostate. Carcinoma of the prostate presents a wholly different picture, most confusing to the inexperienced practitioner. It occurs both earlier and later in life than adenoma, and is the commonest cause of retention of urine beginning in men over seventy. The prostate feels only very slightly irregular in some cases, suggesting ancient gonorrheal infection. But almost always there are areas of hardness in the gland, extending upward around the seminal vesicles, and if felt upon a metal instrument in the urethra this hardness is found to cross the median line at the apex of the gland in sharp contrast to the condition found in adenoma. The cystoscope shows a bladder neck that is irregularly thickened and edematous and possibly ulcerated or showing papillary carcinoma. The most confusing element in the diagnosis is the fact that carcinoma and adenoma may exist together though beginning in different parts of the gland, for it is to be remembered that Geraghty has shown that carcinoma does not begin in portions of the gland which have become adenomatous.

On the other hand, a very large proportion of prostatic carcinomata give as their first symptom something other than urinary disturbance, such as an enlarged gland in the left side of the neck, sciatica (bilateral sciatica is said to be pathognomonic to the prostatic carcinoma) or secondary tumors in bone or lumbar glands. Prostatic carcinoma is often overlooked through failure to make a rectal examination. It may be confused with prostatic stone (see below).

Tabes. Bladder paralysis is not infrequently an early sign of tabes. I have several times seen it in patients whose only other physical sign of the disease was a loss of ankle jerk, and of deep muscle sensibility. These tabetics can often hold their water very well. They show much less vesical irritability than do the prostatitis as a class, and by the same token they usually do well on catheter life. The maximum incidence is between the ages of forty and sixty. The prostate is normal, though it may be pronounced enlarged if palpated while the bladder is still full of urine. The trabeculation of bladder wall and laxity of sphincter said to be characteristic of the tabetic bladder are not to be depended upon as diagnostic signs.

Sclerosis of the Prostate. Sclerosis of the

prostate is to be distinguished from paralysis of the bladder with considerable difficulty in some instances. The sclerotic prostate is often not enlarged, it does not project in any characteristic manner into the bladder, indeed the prostate of a tabetic may be sclerotic. Therefore before operating upon such a case blood and spinal fluids should be carefully investigated for the various syphilitic reactions.

Diverticulum of the Bladder. Diverticulum of the bladder is usually congenital, often associated with some sclerosis of the prostate, usually gives symptoms of retention of urine before the forty-fifth year, may be associated with any of the above conditions and is diagnosed by those who look for it with the cystoscope, or by cystography (radiography of the bladder filled with a fluid opaque to the rays).

Bladder Tumor. Bladder tumor may cause retention due to clots, or to the tumor itself blocking the urethral orifice. It is more likely to be mistaken for prostatic carcinoma than for adenoma.

Stone in the Bladder. Stone in the bladder is not an uncommon cause of prostatic sclerosis and certain cases of recurrent bladder stone are curable only by relief of the prostatic retention even though the amount of urine retained be less than 100 c.c.

Prostatic Stone. Prostatic stone is one of the most elusive of the prostatic conditions causing retention of urine. Most cases of prostatic stone show no symptoms whatever. A fair number have a certain bladder irritability. Prostatic sclerosis may result and cause retention. Three times I have seen prostatic stone that by rectal touch gave an irregular hardness of the prostate absolutely characteristic of carcinoma. But the stones are formed chiefly in the line of cleavage about the lateral lobes and the distinguishing feature between carcinoma and stone in the prostate is that stone causes no thickening of the apex. Fortunately the x-ray always discloses prostatic calculi since these are made up largely of calcium salts.

TREATMENT OF PROSTATISM.

The two real problems in the treatment of prostatism are when to operate, and how to operate.

When to Operate. The prolonged preparation of the patient for operation upon the prostate and the prolonged and careful

after-treatment constitute an orderly systematized medical procedure. But the operation itself remains a blind, bloody, brutal, blundering performance,—an emergency operation, if ever there was one. Such being the case, it is small wonder that a very large proportion of physicians and public still look askance upon the operation, and refuse to submit to its dangers. A patient so minded will seek medical aid only when his painful and frequent urination becomes an unbearable agony, or when his urethra shuts up entirely. He then asks for the catheter, and not for operation and is delighted to carry away this novel toilet article rather than to submit himself to the vicissitudes and dangers of operation.

We should not blame him. He is nearing three score and ten, an age at which the preservation of life is not worth much suffering, and if he can manage to slip comfortably downhill in a gradually increasing renal deficiency, or to be snuffed out by an acute focal renal infection he is certainly better off than some of his friends who have been left with suprapubic fistulae or incontinence of urine, though they may outlive him many a year.

Naturally the urologist dissents, and perhaps he exhibits a very moving series of cases to support his contention that prostatectomy is the sole guaranty of eternal life, both physical and sexual. The cunningest way to reach this conclusion is to divide your operative procedure into two parts, kill off all the feeble patients with the first operation, and then brag about the results of the second one.

As a matter of fact, it is probably still the case, as has often been alleged, that in a cross section of the community the general surgeon or practitioner will promptly dispose of about forty or fifty per cent. of the operable prostaties who seek his assistance, while the specialist will reduce this immediate mortality to about ten per cent.

This is not to say that the specialist does the operation any better than the general practitioner. I think I could teach a qualified general surgeon everything I know about the operation of prostatectomy in one brief lesson. A properly prepared prostatic should never die of prostatectomy (I make the statement rather roughly). But some will die in the course of even the best of preparation. Others will die

because of improper preparation, and many will die because of the fantastic improvements that the surgeon introduces into his operation.

But the pleasure of hitting out at the general surgeon is distracting my attention from the subject I wish to discuss. When should the prostatic be operated upon? The answer, of course, is that he should be operated upon just as soon as he shows symptoms of prostatism. When we get patients at that stage of the disease in sufficient numbers we shall be able to develop an operative technic which shall be a little more decent and cleanly than that we now employ. And we shall be able to save these patients' lives in more than ninety per cent. of cases, and not leave them with irreparably damaged kidneys.

What type of operation should we employ? I can best answer this question by distinguishing three types of cases:

1. The frankly adenomatous type with involvement of all the lobe.
2. The adenomatous type with partial involvement, one of the lateral lobes being apparently not enlarged, or with complicating sclerosis, so that one may question whether the obstruction is due to the sclerosis or to the enlargement of the lateral lobes.
3. The frankly sclerotic prostate and the adenomatous bar due to enlargement of Albarán's glands.

The frankly adenomatous prostate is, I believe curable by the ordinary suprapubic prostatectomy on condition that the mucous membrane of the bladder neck is spared at the superior commissure, and that the fistula is left at a point as distant as possible from the bladder neck. We spare the mucosa so as to prevent postoperative stricture of the bladder neck. We place the fistula high so as to encourage its early closure.*

I did my first prostatectomy on a case of this type in 1898. I have yet to see a recurrence, though this operation does not cure pyonephrosis, renal or bladder calculus, or bladder diverticulum or tumor.

The intermediate class of cases that we may call partial hypertrophy or adenomato-sclerotic cases must be operated upon according to the same principle. If, for example, one of the lateral lobes seems not to be enlarged the finger must nevertheless be introduced into the

* I have no intention of interrupting our evening with discussion of the best methods of operating or of preparing the patient for operation.

urethra, the mucosa torn open over this lobe and such fragments of it as can be enucleated should be torn away. The procedure may seem very futile at the time, but if it is not carried out the patient is doomed to a relapse. Under the best circumstances he will be relieved of his symptoms from four to ten years and then they will recur, due to the adenomatous enlargement of the lobe which was not enucleated.

I have apparently permanently relieved the retention of a number of cases of the adenomato-sclerotic type, by removing absurdly small fragments of the lateral lobes—lobes which did not project into the bladder and whose adenomatous condition could only be appreciated either by the urethroscope or by the finger introduced into the prostatic urethra through the suprapubic wound. The presence of sclerosis, however, makes one fear that these cases will relapse after a certain number of years have gone by.

The problem of the frankly sclerotic prostate is with us still. Bottini, Chetwood, Young, Goldschmidt, Bugbee and Buerger have devised various types of operation, any of which will temporarily relieve a certain proportion of cases.

The most brilliant example of the failure of these procedures that I have encountered is the following case. The patient came to me having had a Buerger operation performed for an obstruction at the bladder neck, which I understand was a small median lobe. This operation did not relieve the chronic complete destruction to urination from which he suffered. He entered Bellevue Hospital last spring, and I performed a suprapubic operation upon him and discovered the bladder neck to be very tightly strictured. I tore open this stricture, and enucleated two very slightly enlarged and sclerotic lateral lobes. This left him with a retention of about 200 c.c. and an open suprapubic fistula. I used the Young punch upon him twice, obtaining no results the first time, and a reduction of his residual urine to 100 c.c. the second time, but within six weeks it had returned to 200 c.c. I then did a Bottini operation upon him (the only one, by the way, that I have performed), and his fistula closed, and his residual urine dropped to about 30 c.c. when he urinates sitting down; but if he attempts to urinate standing up he still has 200 c.c. residual urine. In this condition he has re-

mained for five months, and the amount of his residual urine will doubtless increase.

Fortunately, not every sclerotic prostate behaves quite as badly as this. Slight enlargement of Albarran's glands and sclerotic prostates may be successfully operated upon by the Young punch, and the author of this operation has reported cases that remained well for a number of years. I have reported equally satisfactory results from the Chetwood operation, but only two of my cases have remained well for ten years. One, a purely sclerotic prostate, is apparently well twelve years after operation; the other has now a very large adenomatous prostate, but empties his bladder completely although his operation was performed in 1905. Such accidents may happen.

What, then, is the best operation for the sclerotic prostate, the contracted bladder neck, the slight enlargement of Albarran's glands? To this question I do not know a universal answer. One of my patients remains well twelve years after a tearing open of his bladder neck, thanks to an occasional treatment with the Kollmann dilator. Another died recently of renal calculus, an attempt at suprapubic prostatectomy having been made upon him by myself and by another surgeon. Neither of these operations did him the least good. The residual urine of about 150 c.c., which he had when he came to me six years ago, and which was the occasion of his bladder and kidney stones, remained unchanged by the two operations. At postmortem I was shocked to find that his bladder showed no diverticula and the prostatic orifice was so wide open that the tip of the little finger could be introduced into it scarcely touching its sides, yet his residuum had been undiminished.

Dr. Squier has recently suggested that for such cases the proper operation may be the total removal of the prostate, dividing the urethra at the bladder neck and at the membranous urethra and sewing the two together. In two or three cases his immediate results following such an operation appear to have been excellent.

It seems a pity to close one's remarks in such a pessimistic strain. We can but cheer ourselves with the hope that the next generation of surgeons will succeed where we have failed.

DIFFICULTIES IN THE DIAGNOSIS OF MENINGITIS.

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It is not claimed that the cases included in this paper prove any theory, nor that they add any new facts to the means of diagnosis. Taken simply as interesting cases demonstrating some particular sources of error in the diagnosis of meningitis, possibly they may be of value.

Probably we are all more or less familiar with the meningismus which children are prone to show under a variety of conditions. While it is probable that many of these cases, not due to meningitis might by definition be called examples of "meningismus," none of these patients could properly be said to have a meningismus as I understand the term.

Elsewhere I have reported a series of cases of pyelitis,¹ in which, from the presence of tenderness and rigidity of the neck, and in some instances, in which the Kernig sign was also present, the existence of a meningitis was strongly suspected. Pyelitis is therefore one of the conditions to be considered in making a diagnosis of meningitis; in fact, this is, I believe, a most treacherous possibility of error, which I will not elaborate further here.

Recently there has been much discussion as to what constitutes a serous meningitis, so called, and how one is to distinguish such a "meningitis" from a non-paralytic form of poliomyelitis. A case in which I took great interest along the above line, is recorded as Case 1. This boy, when he first entered the hospital, was semicomatose, in tremendous pain, and crying out from headache. He had a high fever, with marked retraction and rigidity of neck, and seemed to be in an extremely critical condition. A lumbar puncture was done at once. When I saw the boy 24 hours later, he was sitting up eating a hearty breakfast. He had in his spinal fluid a cell count of 300 cubic mm. Since the boy got well practically from one spinal puncture, and since we then did not know much about non-paralytic poliomyelitis, his entrance diagnosis of tuberculous meningitis was changed to a discharge diagnosis of "serous meningitis." Later, when every one was discussing poliomyelitis, I felt that my boy with the serous meningitis and the high spinal cell count must really have been a case of poliomyelitis without signs of paralysis. Recently,

however, I followed up the case, and discovered that the boy actually died of tuberculous meningitis a few weeks after leaving hospital. I suppose that if we had put more stress on this high cell count and on the large predominance of lymphocytes in this fluid, I might have avoided this error in diagnosis; yet it seemed impossible to stick to the admission diagnosis when we had watched the patient for two weeks, during which time he had been perfectly well.

Case 2 exhibits a condition with which I fancy that orthopedic men are more familiar than are internists. The patient was a poor little child in a plaster jacket with all the symptoms of a tuberculous meningitis. That was the diagnosis which I made, and the same diagnosis was made by a pediatricist who saw the child in consultation. We both felt that the child might be more comfortable without her plaster jacket. When we consulted an orthopedist as to this, he stated that removal of the plaster often relieved the symptoms of a meningitis. So it proved in this case. The case cleared up immediately when the plaster was cut, relieving pressure over the kyphos. Here again I do not know what the condition of the spinal cord and meninges was,—whether there was a backing up of more or less infected spinal fluid through the pressure of the plaster upon the tuberculous lesion, or whether carious bone was pressing upon the cord. It would seem as if bone pressure would have given signs of a transverse myelitis rather than of a tuberculous meningitis. Is it possible in such a case to have a non-tuberculous condition of the spinal fluid sufficiently acute to give rise to such a serious condition in the patient? It does not seem so; and in this case, because of the plaster and the Pott's disease, we did not do a lumbar puncture, so we never had any definite evidence on this point. I do know, however, that this child was perfectly well except for her caries of spine, for months afterwards, without any later signs of any further meningitis.

Another patient (Case 3) who twice came under my care as an interne in hospital, and who was also primarily suffering from caries of the spine, dying finally of a meningo-myelitis, is of interest chiefly as showing how much better hindsight is than foresight, and as an example of the tendency, when one cannot find a cause for the pain, to consider the patient's complaints imaginary or neurotic. This pa-

tient, a negro, was admitted and treated, on his first stay in hospital, which lasted for a month, as a case of influenza. He had vague pains all over his abdomen, particularly in the region of his bladder. After repeated examinations, which revealed no cause for his complaints, he was sent home. Nine days later he returned to us at night, moribund, and with a paraplegia and dysphagia. Autopsy showed a necrotic lumbar spine, with a double psoas abscess, and a beginning purulent meningitis.

In passing, I might mention the infrequency with which a Pott's disease is diagnosed or even suspected, in an adult.

Case 4 entered hospital with symptoms and signs only of a severe septic sore throat. The medical service and the consultant from the aural service, first considered that there was a probable syphilitic lesion of the throat. Later as the swelling in the throat increased, we believed that we were dealing with a retro-pharyngeal abscess, but since the mass which protruded into the pharynx was extremely hard, and actually bony in nature, we finally concluded that this must be a bony new growth, probably originating from the cervical spine. When definite rigidity and tenderness of the neck, combined with a double Kernig sign, proved the presence of a meningitis, and lumbar puncture gave a cloudy fluid, we still felt that this condition was in addition to the new growth in the throat. At autopsy, to our great surprise, only a pneumococcus meningitis was to be found,—the bony mass in the throat being due merely to the prominence of the bodies of the vertebrae, pushed forward by the very marked and sharply localized retraction of the neck. While this does not seem possible, on paper, yet both the medical and laryngological services were deceived in this respect up to the very end.

The case which is reported as number five is of less diagnostic importance in that the condition was unusual, the patient having a cerebral tumor and probably an acromegaly. He did, however, after some days in the hospital, develop rigidity and tenderness of the neck, and a well marked Babinski sign on one side. In combination with a temperature which was at times considerably elevated, and the fact that his spinal fluid was shown by lumbar puncture to be under slight pressure, the exclusion of a diagnosis of meningitis was not possible for more than a week.

The histories of these cases follow:

CASE 1. E. M. N. 15 years old. Single. School-boy. Admitted August 19, 1916. *F. H.*—Mother and father, four sisters, two brothers, all living and well. No tuberculosis in family. *P. H.*—Measles as a child. No malaria, pneumonia, typhoid, or rheumatic fever. *P. I.*—For two weeks headache and vomiting. Vomiting came on right after eating. Vomitus contained only food, no blood. Dull pain in abdomen, not localized. Previously well. No cough, dyspnoea, or pain on breathing. No nocturia or polyuria. Has lost some weight, amount unknown. Best weight, 140 pounds.

P. E.—Well developed and nourished. Stuporous and irrational. Responds very slowly to questions, answers not reliable. Much prostrated. Not cyanotic nor dyspnoeic. Pupils dilated, equal, react slowly to light and distance. Mouth: Teeth fair, tongue thick, yellowish-white coat. Throat: No exudate or oedema. No general glandular enlargement. Neck: Moderate rigidity and tenderness on bending. Lungs: Good resonance throughout, breathing sounds not remarkable. No râles. Heart: 2.5 cm. to right, 10 cm. to left of median line. Apex in fifth space inside nipple line. Sounds of fair quality, rate slightly rapid, no murmurs heard. Abdomen: soft, tympanitic, no masses, tenderness or fluid. Liver and spleen not felt. Extremities: No oedema. Reflexes: Knee jerks present, moderate Kernig sign, doubtful Babinski, ankle clonus, and Oppenheim.

August 20. Patient entered in a very stuporous condition, with evidence of meningeal irritation, exaggerated knee jerks, doubtful Kernig and ankle clonus. No Babinski. Irrational. Lumbar puncture performed yesterday. Clear fluid spurted out a distance of six inches and then settled down to a steady stream; 30 cc. removed. Wassermann and colloidal gold tests of fluid negative. Cell count 300 per cubic mm., with lymphocytes preponderating. Widal and blood Wassermann negative. Urine negative except for rare leucocyte. W. B. C. 11,000.

Temperature at admission, 101.0°. Temperature August 19, day of first spinal attack, 100.0°-100.8°. Temperature August 20 to September 14, highest 99.0° on September 4 and 10. Otherwise normal or subnormal. Ninety-

seven and four tenths degrees August 23, 97.8° September 6.

Within four hours after lumbar puncture patient was much brighter, and today (20th) was found by the service sitting up in bed reading the morning paper, remembering incidents of the previous evening and desiring to get up. Had no remembrance of lumbar puncture. Seen today by neurologist, who reports no abnormal findings and advises observation for two weeks.

August 25. Patient improved daily. No return of symptoms. Lumbar puncture performed again today, 15 cc. of clear fluid coming in a constant stream under slight pressure. No clot formed. Cell count 30 cells per cubic mm., with 75% lymphocytes and 25% neutrophils. No organisms in the smear.

August 28. Patient complained today of pain in abdomen and headache. More stuporous. Reflexes normal. Cries out continually, "Oh, cool!" (This was evidently a relapse.)

October 2. After several unsuccessful "dry taps," lumbar puncture was performed yesterday, obtaining 15 cc. of clear fluid under very slight pressure. Cell count 18 per cubic mm., lymphocytes predominating, no clot, bacteriological examination of the smear negative. Patient now mentally clear, feeling fine, attack described in last note cleared up in thirty-six hours.

October 6. Up and about daily. Physical examination negative. No headaches or symptoms.

October 14. Free from symptoms over two weeks. Discharged well.

(As stated in the first part of this paper, I learned in February, 1917, from his family physician, that this patient died in November, 1916, of tuberculous meningitis. There would seem to be no satisfactory explanation of the remission of symptoms and apparent cure, without actual change in the course of the disease as shown in this case. Since then, I have seen two other cases of undoubted tuberculous meningitis, which showed a similar remission of symptoms for a brief period, following lumbar puncture.)

CASE 2. M. M. L. 7 years old. March 14, 1911. F. H.—Four brothers and sisters living and well. No T. B. P. H.—Broncho-pneumonia twice. Has had a dorsal Pott's disease since two years old. Has been treated at Children's Hospital

ever since and is wearing a plaster jacket. Had pertussis for past five weeks, now getting over it. Was told January 1 by school physician that she had phthisis. P. I.—Still has attacks of vomiting, worse past two days. Retains no food now. Has pain in temples and in vertex. Has night cries, not marked nor loud. Had convulsions last night. Now seems delirious. Does not speak.

P. E.—Well developed and fairly nourished. Wearing plaster jacket. Does not answer questions, apparently rational. Quietly delirious. Keeps rolling head. Eyes are constantly turned to the left. Pupils react very sluggishly. Neck slightly rigid and tender. Heart not examined. Pulse: Poor volume and tension. Lungs: Dullness at left apex with crepitant râles. Medium moist râles at right apex. No Kernig. Well marked Babinski on each side. Temperature 100.2°, pulse 120, respiration 30.

March 15. Seen yesterday by pediatricist, who can suggest no further treatment and concurs in diagnosis. Removal of plaster jacket advised by orthopedist. Child is slightly worse and had a bad night. Still having convulsions. Plaster jacket removed.

March 16. Slightly more rational. Taking sufficient nourishment by mouth.

March 17. Much improved. Meningeal irritation has almost disappeared.

April 20. Now able to be out and running about. No more symptoms of meningitis. Lungs as before.

CASE 3. A. R. 29 years old. Single. Colored. Longshoreman. January 16, 1907. F. H.—Mother died, cause unknown, otherwise negative. No T. B. P. H.—Always well. No alcohol for two months. Averages half pint of whiskey a week. P. I.—Duration one month. Onset gradual. Complaint, pain in left side of pelvis, epigastrium and knees. Was "ailing for two weeks," when pain forced him to stop work. In bed for a week. Pain in knees and legs, without swelling, with occasional tenderness, not red, cold to the touch. No chills; slight, vague, occasional pain in abdomen, moving from place to place. No pain in any other joints. No vomiting. No cough. No headache. Occasional dyspnoea. Good appetite. Sleep prevented by pain. Bowels not for a week. Urine cloudy. No gleet for two years.

P. E.—Well developed and nourished. Slight prostration. Colored. Pupils equal and react to light and distance. Tongue: Protruded,

straight, clean. Throat: Negative. Neck: Not rigid or tender. Glands: Not generally enlarged. Pulses: Equal, regular, good volume and tension. Heart: 2 cm. to right, 10 cm. to left of median line, base at third rib, apex in fifth space inside nipple. Action regular, sounds clear, no murmurs. Lungs: Good resonance and respiration throughout. Liver: Dullness fifth rib to costal margin. Edge not felt. Spleen not felt. Abdomen: Low down over bladder patient complains of slight tenderness on deep pressure. Extremities: Knees swollen; slightly red and tender. Knee jerks equal. No oedema. Urine: Negative. Temperature 99.0°, pulse 60, respiration 18. On January 18, 19, 28. February 8, 10, and 12, temperature reached 100.0°; otherwise about normal. January 20: Still complains of pain in abdomen and knees. Eats and sleeps well. Urine: Pale, neutral, 1020, slightest possible trace albumen, no sugar. Sediment few red blood corpuscles and epithelial cells and uric acid crystals. No casts. January 24: Knees much better. Vague pain in abdomen continues. January 28, February 1, 5, 9, still complains of pain in abdomen at each note. February 13: Complains of weakness and indefinite pains. February 16: Up past three days. General physical examination negative. Still complains of vague pains. Discharged relieved. Diagnosis: Influenza.

Re-admission to hospital February 25, 1907. *P. I.*—Patient still complains of the same pains around the region of bladder, but with greater severity. *P. E.*—Moribund. Conscious. Rational. Pupils react to light and distance, equal. Tongue: Protruded straight, clean. Neck: Not rigid or tender. Glands not enlarged. Pulses: Equal, very irregular, poor volume and tension. Heart: 4 cm. to left, 9 cm. to right of median line, base at third rib, apex at fifth space inside. Action irregular, sounds almost inaudible. Lungs: Few râles at right base behind. No dullness. Absent breath sounds over entire right lung. Liver: fifth rib to costal margin, edge not felt. Spleen not felt. Abdomen: Soft, tympanitic, not tender. Extremities: Both arms and both legs completely paralyzed. Patient unable to swallow. In spite of treatment patient grew weaker and died in four hours.

Autopsy report (in part abbreviated): February 28, 1907: Three days post mortem. In

mid portion of left psoas muscle there is an abscess cavity filled with thick yellowish pus. Cavity definitely outlined and walls covered with thick yellow pus. Probe passed upward within cavity follows course of psoas fibres to region of attachment, where abscess communicates with necrotic area between two lumbar vertebrae. In right psoas muscle is a small abscess cavity. This also communicates with necrotic vertebrae. Between second and third, and third and fourth lumbar vertebrae, the inter-vertebral disks have for the most part disappeared, leaving small cavity filled with thick yellow pus. Surfaces of vertebrae bounding the cavity are roughened and small spicules of bone are easily felt with the probe. Cavity between third and fourth vertebrae communicates directly with spinal canal. Smears from pus from between vertebrae show numerous tubercle bacilli in groups and with quite marked vacuolation. Mesenteric lymph nodes not increased in size or consistence. Peritoneum smooth except where spleen is firmly bound to diaphragm. Pleural cavities: Left, no adhesions; right, almost obliterated by dense fibrous adhesions. Lungs: Left, except for posterior part of lower lobe, crepitant. Latter area slightly firmer, dark red, and bathed in a thin air-containing bloody fluid. Right lung deep red throughout. Crepitation slightly decreased, nowhere absent. Thin bloody fluid on section. No T. B. areas on careful search. Bronchial lymph nodes show no macroscopic tuberculosis. Heart, spleen, gastrointestinal tract, pancreas, adrenals, bladder, genitalia, and aorta all negative. Liver: Shining through the surface are several small glistening grayish areas, some of which are made up of moderately dense tissue, while others show central softening. From some of them small drops of pus escape when incised. Head: Not remarkable. Spinal cord dura, shows great congestion of vessels. White substance soft, and with distinct markings on sections. Gray matter stands out prominently and is light pink. On section, the white matter wells over cut edges. Just opposite third lumbar spine, adherent to the posterior portion of the dura and the adjacent spinal canal is a small amount of thick pus.

Anatomical diagnosis: Acute tuberculosis of spine. Psoas abscesses (tuberculous). Multiple abscesses of liver. Chronic adhesive pleuritis. Congestion and oedema of lungs, congestion and oedema of brain and cord.

CASE 4. G. C. 23 years old. Single. Table girl. September 8, 1916. *F. H.*—Father died of typhoid. Mother died, cause unknown. Three brothers living and well. Nine brothers died, cause unknown. *P. H.*—Measles and whooping cough as a baby. Tonsillectomy at 10 years. Pleurisy 13 years ago. Habits: Occasional beer or whiskey. *Cta. regular.* *P. I.*—Patient states that four days ago she had a sore throat and headache, and vomited several times. Cough since onset. Complains of feeling warm about the head, while extremities feel cold. No dyspnoea. No urinary symptoms.

P. E.—Poorly developed and nourished. Face flushed. Marked prostration. Conscious and rational. No dyspnoea or cyanosis. Eyes: Pupils equal and react to light and distance. Ears and nose: No discharge. Mouth: Teeth poor. Throat: Markedly reddened and oedematous. Small perforation in centre of soft palate. Uvula bifid. Neck: Held somewhat rigid, no retraction. Glands of neck markedly enlarged and somewhat tender. Lungs: Moderate dullness at both apices with harsh respiration, otherwise negative. Heart: 3 cm. to right, 9 cm. to left of median line, apex in 5th space in nipple line. Sounds of fair quality. Soft systolic murmur at apex, not transmitted. Pulses: Equal, regular, fair volume and tension. Abdomen: No masses, tenderness, or spasm. Liver and spleen not felt. Extremities: No oedema or tenderness. Knee jerks present and equal.

	8TH	12TH	13TH	15TH	17TH	20TH
Temperature.	101.0	99.0	103.0	103.0	104.0	106.0
Respiration . .	24			28		30
Pulse	110	88	108	118		130

White count on 15th, 17,000.

September 12: Patient markedly prostrated. Throat is very red, oedematous, and with bulging forward of posterior pharyngeal wall in the median line. On entrance a syphilitic condition of the throat was suspected and the aural consultant considers this probable. Today throat suggests a retro-pharyngeal abscess, except that when the protruding mass is touched with a tongue depressor, or with a metal instrument, the mass seems bony hard. Patient is unable to swallow. September 16: Patient growing constantly worse. Seen again by the aural consultant, and a diagnosis of a probable bony tumor from the body of a cervical vertebra is made by him. Today there is noticed marked stiffness and retraction of the neck,

with a double Kernig sign. Lumbar puncture was done and cloudy fluid under considerable pressure was obtained. Culture made from this fluid showed no growth. Flexner's serum given. Wassermann negative. September 20: Patient taking no nourishment. Heart and lungs negative. Patient failed progressively and died this morning. Mass in the throat persisted up to the end. At autopsy there was found a marked case of meningitis. The spinal cord was soft and the canal was full of pus, in which the pneumococcus was found. There was absolutely nothing abnormal in the throat nor in the bodies of the cervical vertebrae.

CASE 5. H. J. 23 years old. Single. Janitor. February 9, 1917. *F. H.*—Father and mother, and three sisters living and well. No T. B., cancer, or insanity in the family. *P. H.*—Measles as child. No diphtheria, scarlet fever, or pertussis. Pneumonia 14 years ago. No typhoid, rheumatic fever, or tonsillitis. No operation or injury. Always incontinent of urine (and faeces?). *P. I.*—Appetite good. Sleeps well. Bowels once daily. Nocturia occasionally, no dysuria or hematuria. Occasional headache. No dizziness or syncope. No cough, dyspnoea, haemoptysis, or haematemesis. Occasional indigestion and belches much gas. No palpitation or precordial pain. No oedema. Never jaundiced. Occasional epistaxis.

Patient was born in a very difficult forceps delivery. There was a question of trauma to nose and forehead from forceps. Nose flat ever since. Since birth "has passed considerable fluid through nose; at times fluid becomes hard and crusted, and when removed shows a cast of that part of nasal cavity from which it came. About a year ago this discharge from nose ceased, recurring on one side only, ten weeks ago, the other side seeming to be stopped up." Two weeks ago patient had an attack of vomiting, which, according to parents, was of projectile type. Had two attacks of vomiting in next three days. About 8 days ago had a convulsion followed on the next day by another, and two days later by a third. Patient himself is dull mentally and no history can be obtained from him as to headache, etc. Parents say that he was always bright in school until he got into the High School, when he became dull and developed a peculiar gait, with awkwardness in all his movements. Gives a history of haemophilia, but tests in hospital have not borne this out.

P. E.—Well developed and nourished. Conscious and rational. Face flushed, breathing somewhat heavily. Stuporous. Head: Cranial bones large compared with size of face. Nasal bones undeveloped and nose of saddle-back type. Upper lip short; drawn upward. Eyes: Pupils small, react sluggishly to light and distance. Motions normal. No strabismus or ptosis. Mouth: Slight pyorrhea. Tongue protruded straight, moist, coated. Ears: Small, not abnormal. Throat: Slight inflammation of pharynx. Neck: No glands. No stiffness. Chest: Pigmentation of left nipple. Heart: Apex in fifth space inside nipple line. Right border 2 cm. to right, left border 10 cm. to left of median line. No thrill. Slight systolic at apex. A2 greater than P2. Lungs: Expansion equal. Resonance, vocal fremitus, and whispered voice normal. Breathing over left lung near scapula intensified and with an occasional rale. Abdomen rounded, tympanitic, no tenderness, spasm or tumors. Extremities: No oedema. Motions normal. Knee jerks present.

Laboratory Reports. Wassermann negative. Widal negative, February 17 and February 18. W. B. C., February 10, 7,200; February 18, 9,400. Blood pressure: Systolic, 145 mm.; diastolic, 90 mm. Urine: February 13 and 15, pale, acid, 1006-1007, no albumen, no sugar. Lumbar Punctures: February 10, 15 cc., clear fluid with 20 cells per cubic mm.; February 18, 18 cc. clear fluid under slight pressure with no organisms present. At entrance, temperature, 102.0°; pulse, 80; respiration, 30. February 13, 1917: Temperature, 101.8°; pulse, 94; respiration, 25. Patient dull mentally, incontinent of urine and faeces. No complaint or apparent discomfort. Physical examination negative except for a definite Babinski sign on the right for the past three days, and neck slightly rigid. Pupils unequal but react to light and distance. February 17: Condition unchanged. Temperature still elevated, cause not determined. Mentally still very dull. Answers questions fairly well. Physical examination as at last note. February 21: X-ray of brain shows a large sella turcica, 25 mm. in diameter, with thinning of the walls, and obliteration of the clinoid process. Probable enlargement of the pituitary body. Neurological consultant makes a diagnosis of cerebral tumor or brain abscess. February 24: Aural consultant re-

ports "profuse discharge of pus from left sphenoid and ethmoid cells, left maxillary antrum apparently discharging pus." February 27: Temperature normal. Parents refuse operation. Discharged with the diagnosis of cerebral abscess and acromegaly.

REFERENCE.

¹ The Meningeal Syndrome and Other Sources of Error in Pyelitis, BOSTON MEDICAL AND SURGICAL JOURNAL, Nov. 15, 1917.

BLOOD PLASMA CHLORIDES VERSUS RENAL FUNCTION.

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THE significance of the chloride content of the blood is imperfectly understood. Widal, Ambard and their associates and, more recently, McLean at the Rockefeller Hospital, have brought out several interesting features of this problem. The threshold for excretion of sodium chloride, *i.e.*, the concentration of sodium chloride in the blood plasma necessary to start excretion of the salt into the urine, is fairly constant at about 562 mgm. per 100 cc. of plasma. When the concentration of sodium chloride in the plasma falls below this threshold value, excretion of chloride practically ceases. The threshold of sodium chloride secretion is not fixed but varies in health and is much influenced by the administration of drugs and by disease processes. It can be considered to represent a regulatory mechanism for the maintenance of a fairly constant composition of the blood. In this respect, it resembles the mechanism in regard to water and sugar excretion and differs from the excretion of nitrogenous substances, which have no threshold value below which excretion does not take place. From the relationships of plasma and urine chlorides to this threshold, Ambard, Chabanier, and Onell have developed their work on the sodium chloride-secretion-constant.

In dropsical renal disease, the secretion threshold is elevated and points to a lowered ability of the kidneys to excrete sodium chloride. On the other hand, the slight retention frequently seen in the nephropathies may be quite independent of any defect in the sodium chloride elimination. Because of the variation seen in health and in disease, calculation of the threshold value for clinical purposes, in an en-

deavor to secure the sodium chloride permeability of the kidneys, is of little value in the presence of mild degrees of retention. It is early in disease processes that we wish to secure evidence of impaired function—at a stage when something can be done therapeutically—and it is because of the features mentioned above that the threshold studies of sodium chloride give us but little aid in early recognition of decreased renal excretion.

That there is some degree of selective excretion by the kidneys seems established. In some cases, urea excretion may be normal while that of uric acid may be definitely impaired. The same selective excretion probably pertains to sodium chloride also. Evidence pointing in that direction may be noted in the "concentration" and "dilution experiments" worked out by Heffer and Siebeck, the "fixation of specific gravity" studies reported by Hedinger and Schlayer and the extensive studies on excretory response to varying diets as worked out by Mosenthal and others.

McLean has summarized our information relative to the problem as follows:

1. The normal and usual range of concentration of blood plasma chloride is from 562 to 625 mgm. per 100 cc. of plasma or higher, according to the amount ingested. On the excess over 562 mgm. per 100 cc. of plasma depends the rate of excretion.

2. There is a relative increased concentration in certain cardiac and renal diseases.

3. Under certain conditions, notably fevers and diabetes, or by the action of diuretics or heart tonics, the chloride threshold may be temporarily or permanently lowered.

4. Failure to excrete chlorides in pneumonia is associated with a lowered concentration of chlorides in the plasma.

5. Edema is usually accompanied by a relatively increased concentration of chlorides in the plasma.

6. Chlorides and urea functions are quite independent of each other.

Most of the work in the blood chlorides has been done on young, healthy adults without evidence of renal disease or on patients suffering from active diseases, acute or chronic. During studies on renal functions here, determination of the plasma chloride values were made by a method described recently.¹ These values were compared with the elimination of phenolsulphonephthalein, the blood urea find-

ings, the blood pressure readings and the urine specific gravity. Other features of the urine analyses were disregarded (there were no cases of glycosuria in the group) for in the type of patient studied, no value can be ascribed to the findings of albuminuria and cylindruria. The cases studied in this connection were active institutional cases, all were workers in the industrial rooms, wards or on the farm, none of them (unless noted) showed any edema, cyanosis, dyspnoea, or other features which are known to compromise excretory rate. The ages of the patients varied from 40 to 85 years, the majority were over 50. None of them were taking drugs of any kind. The blood in every instance was drawn before breakfast, some 12 hours after the preceding meal. The urea determinations were made by the Marshall urease method, the aeration and titration procedure being employed. Determinations of plasma chlorides were made on 5 cc. of plasma, the urea analyses on 5 cc. of citrated blood. The phenolsulphonephthalein test of Rountree and Geraghty was done in the usual manner. The blood pressure values represent the variations from time to time over a period of months, some are the mean of numerous readings.

Table I gives the figures in a group so studied.

TABLE I.

NUMBER	PLASMA CHLORIDE (Mgm. per 100 cc.)	PTHIALEIN	BLOOD UREA NITROGEN	BLOOD PRESSURE	URINE Sp. Gr.
1	594	60%	8.4	140-95	1030
2	512	15%	23.3	120-60	1024
			29.9	165-55	
3	560	30%	10.1	180-95	1022
			14.0	210-80	
4	570	40%	12.8	185-85	1012-22
				230-90	
5	570	50%	13.4	165-105	1019-22
			13.7	190-110	
6	550	65%	13.4	175-105	1024
	534			130-90	
7	546	60%	19.0	125-75	1020
			21.8	155-90	
			17.4		
8	618	55%	13.4	190-94	1014
			15.1	210-85	
			9.2		
9	662	60%	22.4	165-85	1012-24
		35%	15.4	180-95	
10	570	35%	17.3	165-95	1010
		55%		170-95	
11	570	50%	16.0	160-100	1014
	572		15.4		
12	570	30%	12.2	135-90	1010-30
13	560	40%	9.5	140-90	1010
			16.2	175-90	

TABLE I. (continued)

NUMBER	PLASMA CHLORIDE (Mgms. per 100 c.c.)	PHTHALINE	BLOOD UREA NITROGEN	BLOOD PRESSURE	URINE Sp. Gr.
14	554	40%	16.8	120-60	1002-10
15	603	40%	15.4	130-85	1020
16	566	30%	19.6	130-80	1012
		15%			
17	590	35%	18.5	130-90	1030
			19.9		
18	590	35%	10.1	150-85	1026
19	554	40%	18.5	155-85	1025
		30%	8.4	135-90	
20	558	50%	9.5	180-100	1012
			12.3	210-110	
21	542	5%	24.4	150-90	1021
		10%		160-95	
22	562	70%*	17.9	160-80	1013-22
		55%†	15.7	210-90	
		40%‡			
23	572	35%	10.6	185-120	1022
	578		13.4	190-110	
24	580	35%*	9.5	150-95	1020
		50%†	13.7	180-100	
		70%‡	14.6		
25	572	5%	15.7	190-130	1015-30
		5%		150-100	
26	572	30%	16.5	170-115	1006-12
27	540	40%	15.4	170-95	1028
			19.0	180-100	
28	572	40%	12.0	150-100	1018
29	510	45%	12.9	200-120	1020
	522		13.4		
30	498	25%	19.6	160-105	1016
			18.5	170-110	
31	570	25%	11.2	160-90	1015
		35%		175-85	
32	560	30%	11.8	125-75	1020
				170-100	
33	522	10%	17.4	145-90	1025
		5%			
34	520	40%	17.6	170-80	1012-35
			17.6		
35	730?	45%	15.1	150-85	1020
			11.7	180-90	
36	596	25%	10.1	120-85	1025
	522		11.2	170-110	
			15.2		
37	542	60%	11.2	135-80	1024
			15.9	120-80	
38	536	50%	14.5	145-95	1020
			14.0	165-110	
39	590	45%	12.9	160-110	1028
40	570	10%	21.3	165-110	1012-20
41	596	15%	11.2	150-120	1012-22
				190-130	
42	580	30%	22.9	150-95	1012-20
			23.5		
43	658	55%	14.0	175-95	1020-28
44	590	40%	10.6	150-100	1025-30
		55%	11.8	180-100	
45	514	50%	7.2	185-85	1080
46	558	50%*	10.1	200-110	1028
		20%†	12.3	190-105	
47	566	40%	6.7	170-90	1008-18
48	630	40%†	14.0	145-85	1010-20
		30%‡			
49	558	45%	11.2	185-80	1010-14
50	558	65%	9.2	170-100	1016-18
			10.1	240-90	
51	610	40%	7.3	180-60	1008
52	560	50%	12.3	160-65	1008-20
				220-90	

TABLE I. (concluded)

NUMBER	PLASMA CHLORIDE (Mgms. per 100 c.c.)	PHTHALINE	BLOOD UREA NITROGEN	BLOOD PRESSURE	URINE Sp. Gr.
53	530	60%	12.4	165-85	1016
54	566	25%	7.3	170-100	1004-40
55	546	45%*	18.4	210-130	1002-15
		15%†			
56	610	40%	11.7	220-140	1010
	612	10%			
57	606	45%	12.4	135-85	1012-22
58	620	55%	12.3	210-140	1032
				250-70	
59	672	60%	15.4	160-85	1004-10
	540	40%	13.2	200-110	
60	620	65%	12.3	180-90	1022-24
			10.1	220-105	
			12.8	210-130	
61	558	40%	7.6	125-95	1012
62	575	50%	11.4	135-90	1016
63	602	35%	14.4	230-120	1010-14
64	638	15%	8.4	190-110	1420-23
65	670	40%	14.6	260-120	1024
	578				
66	594	60%	14.2	145-95	1030-31
67	560	55%	9.4	155-80	1014
68	602	30%	18.3	175-90	1010-14
69	578	15%	17.5	150-75	1020-24
70	590				
	594	35%	8.6	125-70	1030
			13.4		
71	566	40%	17.6	170-110	1015-35
72	586	50%	10.3	115-75	1022-30
73	586	30%	16.8	180-115	1008-22
74	578	70%	14.3	200-140	1016-30
			16.5	210-120	
75	562	25%	15.4	130-70	1022
			15.9		
76	590	30%	13.4	150-90	1002-24
77	550	45%	—	155-90	1020
78	646	40%	18.2	120-70	1024-30
79	586	45%	16.4	130-75	1032
80	566	28%	18.5	140-75	1020
		25%			
81	708	15%	23.6	230-100	1018-0
	708		22.2		
82	520	40%	17.6	170-80	1012-35
			17.6		
83	540	—	14.3	180-100	1020
84	658	55%	9.2	145-85	1017-26
85	570	25%	25.2	200-85	1020
86	558	40%	—	120-78	1010-18
87	578	60%	—	220-110	1030
88	558	40%	—	155-75	1020
89	586	25%	—	138-85	1012-22
90	590	35%	—	195-110	1010-18
91	540	40%	—	185-70	1030-32
92	594	25%	—	170-100	1008-14
93	590	50%	—	145-85	1020
94	558	35%	—	140-100	1020
95	560	65%	—	140-85	1024
96	558	50%	—	105-65	1010
97	606	40%	—	140-85	1012-26
98	550	45%	—	210-110	1020-22
99	526	25%	—	172-85	1012-20
100	594	50%	—	135-55	1024
101	582	25%	—	120-85	1021-24
102	566	70%	—	155-100	1026
103	554	30%	—	160-95	1020
104	558	60%	—	160-90	1070

* 1917.

† 1918.

‡ 1919.

Of the 104 cases enumerated in Table I, 40 showed plasma chloride values ranging from 554 to 575 mgm. per 100 cc., there were 20 that showed values below 554 mgm. and the other 44 gave figures over 575 mgm. An attempt to relate the values found with the other findings, *i.e.*, the blood urea nitrogen, rate of elimination of phenolsulphonophthalein and blood-pressure readings, showed that of the cases showing a plasma chloride of 560 mgm. or less, 68% of such cases had a red test of 40% or higher, 60% had a blood urea nitrogen of 16.0 mgm. or less and 34% had a systolic blood-pressure of 150 mm. or less, while 26% had a systolic reading of 180 mm. or over. A review of similar findings in the whole group shows that 60% of them showed a red test of 40% or higher, 66% had a blood urea nitrogen of 16.0 mgm. or less, 38% had a systolic blood pressure of 150 mm. or less, and 27% had a pressure reading of 180 mm. or higher. The close relative approximation of these two groups of figures does not permit one to draw a conclusion that the plasma chloride figures bear any relationship to the other features taken as evidence of renal function.

It must be borne in mind that the plasma chloride values depend in part on the alkaline reserve of the plasma and, since the latter is quickly altered by exposure to air, the blood must be centrifuged promptly to minimize the alteration so produced, or drawn under oil to prevent the escape of carbon dioxide, consequent depression of bicarbonate in the plasma and resulting high chloride reading. In the group of cases studied here, the bicarbonate content of the plasma was not determined.

A second group of 40 cases was studied and the plasma chlorides of blood drawn 12 hours after the preceding meal were determined and compared with figures determined three to four hours after a regular meal. The values so found are given in Table II, together with the blood-urea-nitrogen, phenolsulphonophthalein output, blood pressure and urine specific gravity. 85% of the cases showed a definite rise in plasma chlorides after the meal, but an attempt to correlate the rise with any feature of the renal function as evidenced by the other findings enumerated, failed. In both series there was little tendency toward a low fixation of the specific gravity of the urine.

TABLE II.

NUMBER	PLASMA CHLORIDE (before breakfast)	PLASMA CHLORIDE (12 hours after meal)	PUTTALIN	BLOOD UREA NITROGEN	BLOOD PRESSURE	URINE Sp. Gr.
1	500	676	15%	32.8	180-100	
2	564	642	50%	10.4	215-100	1020-80
3	560	668	50%	9.5	140-90	1012-18
	522			14.0	175-120	
4	594	730	55%	13.2	160-120	1008-20
5	610	746	50%	12.2	130-70	1012-30
6	620	660	45%	16.0	130-60	1010-30
7	560	648	20%	20.2	165-95	1018-22
				21.3	180-85	
8	608	716	45%	17.0	135-90	1010-28
9	554	610	55%	7.3	140-70	1020-22
10	538	652	55%	10.4	120-70	1004-14
11	554	530	10%	7.6	155-90	1012-22
12	586	704	45%	8.8	125-75	1010-12
13	560	644	30%	16.3		
14	570	584	40%	10.6	160-90	1025-30
15	546	606	35%	11.7	150-75	1004-20
			15%	12.3	170-80	
16	608	600	15%	18.6	170-100	1022-30
					140-95	
17	618	652	60%	15.4	170-80	1008-30
				15.6	210-120	
				12.0	195-100	
18	600	642	40%	13.4	170-95	1013-14
		686			190-120	
19	590	634	65%	6.2	125-70	1014
20	602	716	45%	15.6	165-85	1078
				11.5		
21	570	572	35%	8.4	130-65	1005-25
22	582	648	45%	16.4	120-100	1032
23	582	660	15%	26.4	170-120	1015-21
			5%			
24	618	742	40%	14.6	170-120	1030
25	590	684	45%	12.9	155-110	1018-28
26	562	674	30%	19.0	115-70	1020-30
27	616	584	15%	18.4	160-90	1012-16
28	574	610	35%	10.6	150-80	1010-20
29	578	600	55%	6.7	205-85	1034
30	558	672	40%	13.2	140-90	1020-22
31	604	636	50%	10.6	160-75	1010-26
32	558	602	10%	17.4	145-80	1028
33	560	584	45%	12.4	130-85	1010-16
34	574	712	—	—	100-55	1010-20
35	562	570	70%	8.4	135-75	1010-20
36	598	596	40%	14.2	140-80	1014-16
37	578	714	40%	8.4	120-80	1025-30
38	610	602	30%	—	145-70	1020-28
39	580	608	—	16.8	160-100	1025
	576				210-120	
40	616	584	15%	22.4	180-100	1012-14

Attention was later turned to the so-called cases of essential vascular hypertension as seen in the out-patient clinics and wards of a general hospital. In these patients, no evidence of nitrogen retention or depressed phenolsulphonophthalein output is obtained to suggest that the origin of the hypertension is failing excretory function. The group which has been studied is still too small to allow comment, but it seems quite probable that many of these people have a high kidney threshold for salt in relation to their elevated blood-pressure. Attempts to lower the threshold of excretion have

been tried but they introduce new features, such as the effect of ingested alkali on the distribution of salt between plasma, red cells and tissues. In some cases, however, it is possible to secure a markedly increased salt output in the urine with a fall in plasma chlorides, but the mechanism is not entirely clear.

SUMMARY.

The blood plasma chlorides were determined in 104 patients showing no obvious evidence of compromising physical disease, the blood being drawn 12 hours after the preceding meal. The ages ranged from 40 to 85 years. No relationship could be established between the chloride values and the blood urea nitrogen, rate of elimination of phenolsulphonephthalein, blood pressure readings or urine specific gravity.

In a second group of 40 cases, the plasma chlorides on fasting blood and blood drawn four hours after the preceding meal were determined. Although 85% of the cases showed a definite and considerable rise after the meal, the rise would not be associated with any consistency with the parallel determinations enumerated above.

The small group of cases of so-called essential vascular hypertension studied seem to show an elevated renal threshold for sodium chloride. Attempts to lower the threshold have given no conclusive results.

REFERENCE.

- ¹ Rappleye, W. C.: A Simple Application of the Volhard Principle for Blood Plasma Chlorides, *Jour. Bio. Chem.*, Vol. xxxv, No. 3, September, 1918.

INSTITUTIONAL CONTROL OF DIPHTHERIA.

By FRANCIS A. FINNEGAN, M.D., BOSTON,

District Health Officer, Massachusetts State Department of Health.

DIPHTHERIA, a communicable disease with an established etiology,—the Klebs-Loeffler bacillus; with a specific curative agent,—antitoxin,—is still responsible for more deaths in the United States than whooping cough, measles, or scarlet fever. It is accountable for 4.4% of the total mortality at ages under 15 years in the registration area, and the average yearly toll is approximately 23,000 lives.

Many reasons are put forth for this still too great mortality, such as failure to call the physician early enough, a delayed use of anti-

toxin and in very severe and late cases the non-use of the intravenous administration of antitoxin. All these facts have been strikingly brought to light by investigators of diphtheria mortality. Failure on the part of the parent or guardian to consult the physician early enough means a late administration of antitoxin and lessens the chances of recovery. Evidence is positive and overwhelming that the earlier the use of antitoxin in any given case the better the result and the greater the chance of recovery.

Dr. J. M. Clements of Hull, England, in discussing diphtheria in elementary schools, and its prevention, said that the mortality among cases coming under his care from 1903 to 1906, classified to the day of the disease on which antitoxin treatment started, that of those coming under treatment on the first day was nil; on the second day 1.5%; on the third day 8%, etc., the mortality percentage rising with each successive delayed day.

The intravenous injection of antitoxin in very late and severe cases lets loose immediately into the blood stream the curative agent and results in a quicker attack upon the diphtheria toxin or poison circulating in the blood.

It would seem, therefore, they must utilize another practical method of immunizing against diphtheria. The Schick test has made it possible readily to detect persons susceptible to the Klebs-Loeffler bacillus or diphtheria bacillus and if susceptible to be actively immunized with three injections of toxin antitoxin at weekly intervals. Schick re-tests should subsequently be made to determine the success of the protection obtained. Already in two institutions in Massachusetts there has been successfully carried out the Schick test and after immunizing with diphtheria toxin antitoxin these two institutions, where formerly diphtheria had been endemic and epidemic at times, have been able to keep their diphtheria rate to almost nil since the advent of this practical method of control. Each inmate on entrance is given the Schick test and if positive (meaning susceptibility to the disease), is given three successive doses of diphtheria toxin antitoxin at weekly intervals. The re-Schick test is tried at intervals of six months, one year, two years, etc. In one institution where the work has been carried out for the past two years under the immediate supervision of the State Department of Health these re-Schick cases on persons once susceptible, that

is, with a positive Schick and actively immunized with toxin antitoxin, are now negative Schicks, showing that the immunity produced has afforded, up to the present time, a two-year protection.

In New York where the work has been carried out by Drs. William A. Park and Abraham Zingher the protection afforded to all those immunized by toxin antitoxin has now lasted several years. Up to the present time this procedure has been confined to institutions and is undoubtedly most excellent and valuable. Applied to a community it would mean that with increasing knowledge of the number of permanent immunes and the selection and immunization of the susceptible ones we may finally be able to get control of the disease that continues to be one of the biggest issues of preventive medicine.

Clinical Department.

TWO CASES OF FOETAL ASPHYXIA WITH UNCOMMON HISTORY.

BY CHARLES J. KICKHAM, M.D., BOSTON,

Obstetrician, St. Elizabeth's Hospital.

CASE 1. Mrs. K. Para VI. Previous history, normal deliveries.

Patient about term. Had been in habit of arising about 6 A.M. each day and walking to bathroom, a distance of about 30 feet. On morning in question, arose as usual and started for bathroom; when about 20 feet from bed, felt "something come down in passage" and went back to bed. Patient had no pain or discomfort and thought her "womb had fallen." Immediately called the writer by telephone, but did not attempt herself to ascertain the condition, assuming that it was "fallen womb."

I reached patient's house in about one-half hour and found her in bed covered by sheet and blanket and got the above history.

On pulling back covers, to examine, found full-term foetus wholly outside vagina, with the exception of head, the latter was still within vagina and vulva contracted around neck. Complete delivery done at once and foetus found in state of pallid asphyxia but with foetal heart still audible. Continuance of efforts to resuscitate, for more than one hour, proved futile and child died without breathing.

Comment. Child probably died from smothering and not from vulval pressure on cord or neck, and thus interference with blood supply. Seemed strange that patient had no pain and that what was apparently a breech presentation did not complete itself by precipitation on floor, since perineum and cervix were so far relaxed as to allow a full-term body to be born through vulva without subjective pain to mother. Unfortunate that patient did not examine herself, in which case she might have completed the delivery and saved the life of the child.

CASE 2. Mrs. B. Para IV. Previous history, normal deliveries.

Patient about term. Went to bed and to sleep at about usual hour. Awakened in about one hour with sharp pain in lower abdomen and felt "something" come away, which she thought was probably baby. Husband called me at once and upon entrance into room, I heard infant's cry and assumed that precipitate delivery had taken place, with living baby. After scrubbing up, went to tie cord and on examination found that a twin precipitate delivery had taken place and that one foetus was still within its amniotic sac, which had not ruptured, though entire sac was outside vulva. Membranes ruptured at once and though foetal heart was beating, child had typical appearance of pallid asphyxia and all attempts at resuscitation failed; baby died without breathing.

Comment. Uncommon to have twin precipitate delivery. Strange that force of delivery did not rupture both amniotic sacs. Unfortunate that mother did not recognize that twin delivery had taken place, in which case she might have ruptured sac and saved baby's life.

Book Reviews.

Industrial Nursing. By FLORENCE SWIFT WRIGHT, R.N. New York: The Macmillan Company. 1919.

This volume attempts to outline the conditions by which the nurse is confronted upon entering the field of industrial nursing. This work is as yet too recently developed to have become standardized; but an outline of the necessary methods, records, equipment, and restrictions as they exist at the present time, subject to modification in the future, will be of

great value to the pioneers in this field of service. The work of the industrial nurse is so varied that a general description of it is difficult. This volume, however, gives a comprehensive view of the activities of the industrial nurse,—in large and in small industries, in mills, factories, department stores, mining villages,—doing first-aid work, supervising lunch rooms and rest rooms, assisting in employment problems, teaching first aid, hygiene, home nursing, child care, and English, and visiting the homes. This book gives a brief historical account of the development of industrial nursing, outlines the qualifications and necessary training of the industrial nurse, the principles of nursing, and the relation between the nurse, her employer, and the workers. Of considerable help will be found the suggestions for organizing the first-aid room and for keeping records and reports. This book will prove to be a helpful guide to nurses who may desire to prepare themselves for meeting the growing demand for the trained nurse in industry; it should also indicate to employers to what extent the nurse can aid the development of his organization, employees, and the community.

Military Surgery of the Ear, Nose, and Throat.

By HANAU W. LOEB, M.D. Philadelphia and New York: Lea and Febiger. 1918.

This manual of military surgery of the war reviews the surgical literature which pertains to the ear, nose, and throat. The author has divided his chapters into two parts: in the first he discusses wounds and treatment of the ear, nose, and throat on the basis of his own experience and from his study of war literature; in the second part he presents a more complete review of the literature in detail. In separate chapters are considered the treatment of injuries of the external ear, middle ear, and internal ear, the psychoneuroses of hearing and speech, reconstruction and reëducation, injuries of the external nose and nasal cavities, of accessory sinuses, the throat, the pharynx and esophagus, larynx and trachea. The problem of paralysis in connection with wounds of the throat, stenosis of the larynx and trachea, and the ear and aviation are other topics of interest. The book has been written from the point of view of a trained otolaryngologist, with no explanation of elementary principles and practice.

A Textbook of Urology in Men, Women and Children, Including Urinary and Sexual Infections, Urethroscopy and Cystoscopy. By VICTOR COX PEDERSEN, A.M., M.D., F.A.C.S. Major, Medical Corps, United States Army; Consulting Physician to the Selective Service

Headquarters in the City of New York; Member of the Council of National Defence, New York State Committee, Medical Section; Visiting Urologist to St. Mark's Hospital; Major, Medical Reserve Corps, United States of America; Member of the American Urological Association, American Medical Association, New York State and County Medical Societies, New York Academy of Medicine, American Electrotherapeutic Association, the Association of Military Surgeons of the United States, and of the Committee on Venereal Diseases of the Advisory Council of the Department of Health of New York City. Illustrated with 362 engravings, of which 152 are original and 13 colored plates. Philadelphia and New York: Lea and Febiger. 1919.

This is a large book of about one thousand pages and is written from a point of view which makes it difficult to review. Its perspective is quite different from that of most important works of this kind. The first two-thirds of the whole book are devoted to a careful, detailed, most thorough, and excellent consideration of the great subject of gonorrhea, its sequelae and complications in both sexes and in all ages, while another great subject—that of "Diseases of the Prostate"—is given attention only in the last twenty pages of the book. The surgery of the whole urinary tract from prostate to kidney is confined to the last two hundred pages. Gonorrhea and its sequels, then, have received the lion's share of attention, and from this point of view the book is of the first importance. The urologist, however, who is interested in his specialty chiefly from the side of operative surgery will not be so well satisfied.

There are excellent chapters on the "General Principles of Diagnosis" and the "General Principles of Treatment." The chapters on urethroscopy and cystoscopy are good. In his consideration of the treatment of some of the more chronic manifestations of inflammatory disease, it is pleasant to find the author insisting upon the usefulness of those all too much neglected assets, hydro, helio, and electrotherapy.

The book has been prepared with the most painstaking care and thoroughness and its index is adequate. The illustrations are for the most part good but are noticeably lacking in connection with some descriptions of operative technique where their presence would have helped. The author may feel that his four years of hard work have produced a valuable book which the publishers have printed in a form worthy of it.

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COMPULSORY VACCINATION.

THIS year the joint committee of the Massachusetts Medical Society and of the Massachusetts Homeopathic Medical Society on State and National Legislation has introduced a bill to amend the present law, as follows:—

Section 6.

A minor under fourteen years of age who has not been vaccinated shall not be admitted to a public or private school except upon presentation of a certificate signed by a registered physician that the physician has, at the time of giving the certificate, personally examined the child and that he is of the opinion that the physical condition of the minor under fourteen years of age is such that his health will be endangered by vaccination. The said certificate shall state the reason for the opinion of the physician who signs it, and shall be valid only for one year from the date thereof.

A similar bill failed of passage by last year's

Legislature. During the past year the anti-vaccinationists have not only been unusually noisy but they have also carried on such an energetic still hunt among the legislative candidates that they now claim a majority for the repeal of all compulsory vaccination.

It would therefore, at first thought, not seem to be a favorable time to seek for improvements in the present law. But would it not be better to let the law be repealed than to let its enforcement continue to be so partial and farcical as it is now?

Why should the private schools continue to be exempted from the vaccination that is required of all public school pupils? They do not want to be exempted. And why should school committees and boards of health have to accept, as an excuse for the non-vaccination of any pupil, a medical certificate signed, perhaps years before, by a physician who may never have even seen the child?

There are some physicians, no doubt, who honestly believe that vaccination is detrimental to health. There are others who are willing to oblige parents who cherish this delusion by signing exemption certificates. All right. Be it so. Surely there can be no valid objection by such physicians and parents to the requirements of the proposed amendment that these exemption certificates shall be given only after physical examination, shall state the reasons for belief that vaccination would be detrimental, and shall be good for only one year from date.

Of course it is useless to try to change the anti-vaccinationists, just as it is vain to expect the unanimous approval of any other measure however well it may have been proved to be for the common good. But where either the enactment or repeal of laws for the protection of the public health is proposed the responsibility rests upon the medical profession to give the facts and to explain the principles involved. If every Senator and every Representative is given these facts regarding both the efficacy and the harmlessness of vaccination as it is now practised, then, and only then, shall we be clear of responsibility in case the anti-vaccinationists defeat the proposed perfecting amendments or, worse yet, succeed in repealing our present law. This duty, while devolving heavily upon the committee really rests upon us all.

ALFRED WORCESTER, M.D.,
President, Massachusetts Medical Society.

METHYL ALCOHOL POISONING.

As was to be foreseen, the prohibition of the sale of wholesome alcoholic beverages has resulted in the placing on the market of poisonous illicit beverages containing methyl alcohol. This tendency is, of course, becoming more pronounced as private supplies are exhausted, and there have been reported recently a number of poisoning cases in Connecticut and Western Massachusetts. On December 27, 1919, the number of deaths in Springfield, Hartford, Chicopee, Holyoke, Greenfield, and Thompsonville had reached sixty-two. Upon investigation, it was discovered that the proprietor of a hotel in Chicopee had bought fifty gallons of supposed whiskey manufactured in New York chiefly from wood alcohol.

In Boston there had been reported up to December 27 only two deaths due to methyl alcohol. In order to warn the public against the dangers of such beverages, Dr. William C. Woodward, of Boston, issued a statement describing the nature of methyl alcohol poisoning. Vertigo, blindness, and death generally follow an overdose in rapid succession. The physiological action of methyl alcohol differs from that of grain alcohol in that the coma persists for longer periods of time. The alcohol is oxydized to formic acid, which is eliminated as sodium formate after it is taken into the body, so slowly that the repetition of small doses results in the cumulation of the poison. The exhilarating effect produced by methyl alcohol is followed quickly by vertigo, nausea, vomiting, headache, dilated pupils, delirium, persistent coma, and death. Even in case of recovery, there is danger of blindness due to atrophy of the optic nerve. Blindness may be caused by five teaspoonfuls of methyl alcohol; death may result from taking less than one-half a pint. Death may occur after a few hours, or it may be delayed for two days.

For treatment, a syphon tube is used, the contents of the stomach are diluted with warm water, and the stomach is emptied. In some cases, the alternation of hot and cold water effusions help the coma. Artificial respiration may be necessary sometimes, and the circulation may need to be stimulated with strychnine. Strychnine and other stimulants often will benefit optic neuritis.

It is probable that in spite of the deaths re-

ported recently in the Connecticut valley, Massachusetts is better protected against the misuse of methyl alcohol than other states. On July 24, 1919, there was passed by the Legislature a law requiring all dealers in methyl alcohol to procure a license. This statute, in addition to the protection afforded by the internal revenue laws, serves to restrict the use of the poison in this state. It is to be regretted that this law places no limitation upon sales.

The number of deaths from methyl alcohol which have been reported throughout the country has resulted in a government attempt to prohibit the sale of the liquid. Prohibition commissioners, in each state, have been instructed to use every possible means of warning the public. The Public Health Service is planning to distribute pamphlets showing the dangers of drinking any beverage containing large amounts of alcohol.

In regard to the deaths which have occurred already, investigation will be made and the offenders prosecuted. If present laws are inadequate, it is probable that Congress will be asked to pass additional legislation immediately. It has been suggested that the same system now in effect against the use of narcotics be applied to the sale of wood alcohol,—that the wholesale and retail dealers be licensed and allowed to sell the product only for purposes which are unquestionably legitimate. Although it was almost inevitable that prohibition should be followed by such a catastrophe, it is to be hoped that the recent tragedy will serve as a sufficient warning to the people of this country.

THE INCREASE OF VENEREAL DISEASE
IN GREAT BRITAIN.

It has been for some time a debatable question as to whether the campaign against venereal disease is proving to be as beneficial as it has been hoped and believed that it would be. In this connection, it is interesting to note the views of a British writer on this subject in an article published recently in *The Medical Press*. He observes that it was to be expected that an increase in venereal diseases would be one of the inevitable results of the return of British soldiers to civilian life. In this there has been no disappointment; but can the continued increase be explained indefinitely on this basis?

It is true that hospitals and venereal centers still report an increasing number of applicants, which no longer can be explained and taken for granted as a result of demobilization. Since the ending of hostilities, soldiers and civilians alike have been warned repeatedly against venereal infection; every effort has been made by official and private agencies to educate the public and enforce the lessons of the preventive campaign. Yet, there are those who believe that the immediate result of educational efforts may have been carried too far and may have merely placed a premium upon immorality. The man or woman of questionable morality, although impressed by the statements regarding the noxious effects of a syphilitic infection, does not fail to appreciate that the risk can be taken at the present time with greater security than hitherto it has been possible. Furthermore, it is not unlikely that even the usual precautionary measures for cleanliness and prophylaxis may be taken less seriously than before the venereal clinic was at hand to welcome the offender and provide necessary treatment.

The object of the preventive campaign has been to benefit the race as a whole; yet it appears that not infrequently it is being made use of by the individual for personal rather than for altruistic purposes. By many British officials the increased incidence of venereal disease is regarded as a hopeful sign, indicating that it merely shows a wider recognition of the facilities for early treatment provided by the venereal clinics. It would be gratifying if this view could be accepted unquestionably; but the fact that there has been time for some noticeable improvement, while in fact there has been reported a seventy per cent. increase in cases of gonococcal conjunctivitis in infancy, leads *The Medical Press* to question the success of the efforts made to prevent venereal disease in Great Britain.

BOSTON MEDICAL LIBRARY.

THE annual meeting of the Boston Medical Library was held in Sprague Hall at the Library on Tuesday of last week, January 13, 1920. Dr. Edward H. Bradford gave an interesting talk entitled "Bone Setting, Osteopathy and Chiropraxy," which it is hoped

may be published in a future issue of the JOURNAL.

At its stated meeting on December 9, 1919, the Council of the Library had voted to recommend to the Corporation the repeal of the present by-laws and the adoption of a revised draft already approved by the Council. The following explanatory statement indicates the nature and purpose of this revision:

"The division of members into Fellows and Associates, inaugurated in 1901, as based on the limits of old Boston and the Suffolk District Medical Society, is not appropriate at the present time, when the subway and the automobile have transformed the problems of transportation. A study of the map of Boston and its suburbs will show that the plan now proposed is much more equitable than the existing one, being based on distance from the library rather than on old, irregular county lines.

"Since removing to the Fenway, the number of books in the library has increased from 33,000 to over 100,000, and the expense of caring for these valuable collections is steadily increasing; salaries, coal, supplies, everything has gone up in price to an alarming degree. The library is dependent to a large extent on the dues of its members to meet its running expenses, our unrestricted funds being entirely inadequate for this purpose.

"The rearrangement and enlargement of the territory from which Fellows can be drawn, according to the plan now offered, should increase the number of Fellows and furnish some augmentation of our income. Those who, as a result, have their dues raised to ten dollars will be given the privilege of voting and of thus taking an active part in all the doings of the corporation. They can also help in a greater measure to sustain an institution recognized by all as of the greatest value not only to the medical profession but to the whole community."

The revision was unanimously adopted, and may be expected to meet satisfactorily the new conditions above described.

MEDICAL NOTES.

THE STUDY OF FOREIGN MEDICAL METHODS.—In order to make observations on public health administration and methods of medical education in England and on the Continent, Dr. Wickliffe Rose and Dr. Richard M. Pearce sailed recently for Europe. Dr. Rose is the general director of the International Health Board of the Rockefeller Foundation, and Dr. Pearce has been appointed recently director of a new division of medical education.

YELLOW FEVER COMMISSION IN MEXICO.—The yellow fever commission of the Rockefeller Foundation, of which General Gorgas is the director, is being represented in Mexico by Dr. Theodore C. Lyster, formerly a colonel in the United States Army.

DEDICATION OF PATHOLOGICAL LABORATORY.—The principal address at the dedication of the new pathological laboratory of the Philadelphia General Hospital was delivered by Dr. William H. Welch, of the Johns Hopkins University, who discussed the important part played by morbid anatomy in the advancement of medicine. Other addresses were given by Dr. Arthur D. Bevan of Chicago and Dr. Louis B. Wilson of Rochester, Minnesota.

INCREASE IN FRENCH BIRTHRATE.—Statistics for the month of December, 1919, show a large increase in the birthrate in France, the rate in Paris having doubled since the beginning of the year. January, 1919, the birthrate was 9.5 per thousand, while for the month of December the rate exceeded eighteen per thousand. Deaths have decreased from eighteen per thousand in January last to fourteen per thousand in December. The number of marriages is increasing also.

RED CROSS AID FOR FORMER SERVICE MEN.—The American Red Cross has authorized the transfer of seven hundred thousand dollars' worth of Red Cross hospital material to Public Health Service hospital warehouses, to be used for the comfort of former service men who are under treatment in United States Public Health Service hospitals. The material includes gauze bandages, towels, comfort kits, laundry bags, fracture socks, and other articles. The supply will be ample to provide for the thousands of patients now in the hospitals as well as for the hundreds expected to enter for treatment. Any former soldier, sailor, or marine suffering from illness or injuries contracted in the service need only apply to the Red Cross home service section in his locality to take advantage of the expert service which the Government offers without expense to him.

VANDERBILT UNIVERSITY MEDICAL SCHOOL.—The sum of four million dollars has been granted by the General Education Board of New York to be used for the purpose of enabling the university to effect an entire reor-

ganization of its medical school and in establishing a new school of medicine in Nashville as an integral department of Vanderbilt University. Detailed plans have not yet been developed; but it is probable that they will involve the completion of the Galloway Memorial Hospital, with enlarged facilities for public patients, the erection of an additional hospital unit in the near future, the organization of a modern laboratory building, and the appointment of an increased number of professors to give their entire time to the school and hospital in both laboratory and clinical branches. The gift which will make this reorganization possible was made from the general funds of the General Education Board, and not from the recent donation of twenty million dollars made by Mr. Rockefeller for the promotion of medical education in the United States.

GIFTS OF MR. ROCKEFELLER.—An announcement was made on Christmas Day that two large gifts had been made by Mr. John D. Rockefeller,—fifty million dollars to the Rockefeller Foundation and fifty million to the General Education Board, the money to be available for immediate use. The gift to the General Education Board was accompanied by the following statement by Mr. Rockefeller:

"The attention of the American public has recently been drawn to the urgent and immediate necessity of providing more adequate salaries to members of the teaching profession. It is of the highest importance that those intrusted with the education of youth and the increase of knowledge should not be led to abandon their calling by reason of financial pressure or to cling to it amid discouragements due to financial limitations.

"It is of equal importance to our future welfare and progress that able and aspiring young men and women should not for similar reasons be deterred from devoting their lives to teaching.

"While this gift is made for the general corporate purposes of the board, I should cordially indorse a decision to use the principal, as well as the income, as promptly and largely as may seem wise for the purpose of cooperating with the higher institutions of learning in raising sums specifically devoted to the increase of teachers' salaries."

Since the establishment of the General Education Board in 1902, Mr. Rockefeller has given a total amount of thirty-two million dollars for its use. The interest on this sum is distributed currently, and the Board is empowered to distribute the principal at its discretion.

A RECENT MEDICAL PERIODICAL.—During the past year there have been established a number of excellent periodicals devoted to medicine and public health. Among these may be mentioned *Modern Medicine*, edited by Alexander Lambert, M.D.; S. S. Goldwater, M.D.; and John A. Lapp, M.D. Contributors to the latest issue include Professor George C. Whipple of Harvard, Professor Ellsworth Huntington of Yale, David L. Edsall, M.D., Dean of the Harvard Medical School; W. A. Evans, M.D., former health commissioner of Chicago; George W. Crile, M.D., and C. D. Selby, M.D.

THE SCHOOL AND PUBLIC HEALTH NURSE IN ARIZONA.—The value of the school nurse and the public health nurse is recognized in Arizona. The school nurse endeavors to see that the children are cleaner, better fed, and live in more sanitary surroundings, and her work frequently doubles the value of the regular school work. The public health nurse is the real guard against outbreaks of epidemics; she gains the confidence of the women, especially of those in the poorer quarters, and contributes an important element in the creation of a higher standard of citizenship by improving health conditions throughout the state.

DRUG PRICE CHANGES.—For the week of January 2, the Drug and Chemical Markets reported the following changes in drug prices:

Camphor and quicksilver are lower this week. Quinine has declined ten cents an ounce. Ergot and thymol are higher. The market is active, but buyers limit their purchases to small amounts pending developments after stock-taking. Many essential oils are still advancing, owing to scarcity. Oil of lemon, bitter orange, spearmint, sandal-wood, linalol and oil mirbane are firmer. Oil of caraway, cedar leaf and cloves are easier.

American dyes are sold ahead for several months, and some of the colors are extremely scarce. Many crudes are off the market. Coal-tar intermediates are in heavy demand, and only limited stocks are available.

The vegetable oil markets are quiet. Soya bean and linseed oils are in good demand, and prices are firm. There was more activity in cocoanut oil this week and stocks are said to be limited and prices are advancing.

Caustic soda is scarce, and prices are firm. Bleaching powder is practically off the market. Bichromate of potash is lower. Sulphuric acid prices are very firm, and buyers find it difficult to locate supplies.

AID FOR TUBERCULAR GERMAN CHILDREN.—The American section of the German Red Cross has received the sum of 2,500,000 marks which has been donated by relief committees in the United States for the benefit of tubercular and undernourished children. This will enable more than two thousand children to be benefited by improved climatic and food conditions. Mr. Hoover's plan to coördinate American food relief so far as it concerns the transfer of personal donations from Americans is reported to have been approved by the Germans, and it is believed that it will terminate the abuses resulting from indiscriminate shipments through American forwarding agents. In many instances hitherto, packages have arrived in poor condition, with evidence of a minimum amount of attention given to the selection of food, the manner of packing, and the method of shipment.

MENTAL HYGIENE.—The United States Public Health Service has outlined a program in mental hygiene for coöperating with other national agencies and with state agencies in the development of a rational plan for preventing mental disorders and improving the care to be given to those persons who are affected already. There will be organized a group of persons skilled in mental hygiene, psychiatric courts will be established, and immigrants will be observed carefully as they enter the country. All possible measures will be taken to protect the mental as well as the physical well-being of the nation.

BOSTON AND MASSACHUSETTS.

WEEK'S DEATH RATE IN BOSTON.—During the week ending Jan. 3, 1920, the number of deaths reported was 253 against 488 last year, with a rate of 16.32 against 31.95 last year. There were 39 deaths under one year of age against 37 last year.

The number of cases of principal reportable diseases were: Diphtheria, 56; scarlet fever, 86; measles, 232; whooping cough, 57; typhoid fever, 1; tuberculosis, 32.

Included in the above were the following cases of non-residents: Diphtheria, 14; scarlet fever, 6; tuberculosis, 6.

Total deaths from these diseases were: Diphtheria, 11; scarlet fever, 1; measles, 1; whooping cough, 3; tuberculosis, 16.

Included in the above were the following non-residents: Diphtheria, 4; scarlet fever, 1; tuberculosis, 4.

Influenza cases, 10.

MASSACHUSETTS GENERAL HOSPITAL TRAINING SCHOOL FOR NURSES.—The graduating exercises of the Training School for Nurses of the Massachusetts General Hospital were held on January 15, 1920, in the Moseley Memorial Building on Fruit Street, Boston. Dean Herbert E. Mills, of Vassar College, delivered an address. The exercises were followed by a reception.

CONVENTION OF AMERICAN BACTERIOLOGISTS.—At the convention of the Society of American Bacteriologists held recently in Boston and Cambridge, Dr. Charles Krumweide, of the research laboratory of the New York Health Department, was elected president of the Society, in place of Dr. C. S. Prescott of Boston, whose term expired. Dr. F. C. Harrison, president of the MacDonald College in Montreal, was elected vice-president, Dr. A. Parker Hitchens of Indianapolis was reelected secretary-treasurer and Dr. J. W. M. Bunker was chosen assistant secretary, a new position in the organization. New members of the council are Dr. F. P. Gay, professor of pathology and bacteriology at the University of California, and Dr. C. G. Bull, professor of immunology at the Johns Hopkins School of Hygiene in Baltimore. A committee on national research was created, consisting of all the past presidents, with Dr. Bunker as executive secretary and Dr. S. C. Prescott of Boston as chairman.

The opening meeting of the association was held at the Harvard Medical School with about two hundred members present. It was voted to increase the correspondence membership limit to twenty-five so as to include a number of foreign bacteriologists of renown; to pre-

sent complete files of its journals to Sir Arthur Newsholme and to the universities at Belgrade and at Louvain. The Society voted to provide for the possibilities of the creation of a Western division to include the bacteriologists on the Pacific Coast, affording them an opportunity to cooperate more closely with the Society, and to provide for representation on the National Research Council.

Dr. D. H. Bergey of the University of Pennsylvania addressed the meeting on the subject, "The Teaching of Elementary Systematic Bacteriology"; Professor C. E. A. Winslow of the Yale Medical School presented the final report on "Characterization and Classification."

At the second session of the Society, Dr. Edward Bartow, of the Illinois State Water Survey Board, discussed the bacterial methods of water analysis used with the American Expeditionary Forces. A paper prepared by Dr. W. F. Montfort and Miss Margaret C. Perry of the Illinois State Water Survey Board, was read by one of the delegates to the convention. This paper dealt with "some atypical colon-aerogenes forms isolated from natural waters," and was the subject of considerable discussion. An address on "Bacillus Botulinus in Canned Olives," prepared by Dr. R. B. Edmonson, G. G. DeBord, and Charles Thom of the Bureau of Chemistry in Washington, was read. Dr. J. R. Esty of the National Canners' Association discussed "Resistant Bacteria Causing Spoilage in Canned Foods," and Dr. W. D. Bigelow of the same association spoke on "Heat Penetration in Canned Foods."

At the third session, held at the Massachusetts Institute of Technology, the chief topics of discussion were "Human Pathology" and "Immunology." The pathogenesis of lobar pneumonia was discussed by Dr. Francis G. Blake of the Rockefeller Institute, "Routes of Infection of the Lung in Pneumonia" was considered by Dr. George H. Smith of the Yale Medical School, and "What is the Influenza Bacillus?" was discussed by Dr. T. M. Rivers of the Johns Hopkins Hospital. Other addresses included "Flora in Dysentery," by Wilbert C. Davison, M.D.; "The Bacteriology of Chronic Arthritis and Chorea," by John H. Richards, M.D.; and "Diphtheria Toxins," by Dr. Lewis Davis of Detroit and G. H. Robinson, M.D., and P. D. Meader, M.D., of the Baltimore School of Hygiene.

NEW ENGLAND NOTES.

ITALIAN WAR RELIEF FUND.—The New England branch of the Italian War Relief Fund has received contributions to the total amount of \$318,750.05. There is great need of money to purchase necessities for the suffering people in devastated districts.

 Miscellany.

A DISTINGUISHED FRENCH PHYSICIAN.

IN the issue of the *Medical Press and Circular* for December 12, 1917, appeared the following account of Broussais, a distinguished French physician, and of his great work, "Doctrines Médicales Généralment Adoptées," published in 1816.

FRANÇOIS JOSEPH VICTOR BROUSSAIS, M.D., Knight of the Royal Order of the Legion of Honour, Physician in Chief and First Professor in the Military Hospital of Instruction of Paris, Member of the Royal Academy of Medicine of France, of the Royal Medical Society of Madrid, of the Patriotic Society of Cordoba, Corresponding Member of the Society of Emulation of Liège, of the Medical Societies of Philadelphia, New Orleans, and Louvain, was then forty-four years of age, and had already incurred the enmity of his medical brethren. Even after his death their animosity was unforgiving; the nickname Sangrado that Alain René Le Sage had applied to Helvetius; and the scarcity of leeches in France was ascribed to his "hirudinomania." Born in the little old-fashioned town of Dinan, in Brittany, where he received his general education in the town college, and his first lessons in medicine from his father, who was a physician. In 1789, however, the reported victories of Pichegru and Dumouriez, changed his views, and he enlisted in one of the newly formed Republican regiments as a sergeant, and in 1798, "swung a cutlass as a privateersman," but ill-health necessitated his retirement from active service. He resumed his medical studies and graduated in the University of Paris in 1803. In 1805 he rejoined the Army as a surgeon, and as such served with the troops in Germany, Holland, Italy, and Spain. This period of his life

is of the utmost importance to all who desire to form a just opinion of his works and character. Happily he was exact, keeping notes of his cases (no easy task for an army physician during the Napoleonic wars), which are embodied in the English translation of his "History of Chronic Phlegmasiae, or Inflammations," 2 vols., 8vo., which formed the groundwork of his series of lectures, including those on *Enteritis* and *Gastro-enteritis*, lectures which were attended by Pierre Charles Alexandre Louis, and directed his attention to the differentiation of typhoid from typhus fever.

These lectures show Broussais at his best, and explain, if they cannot justify, his belief in the starvation theory of treatment of enteritis and gastro-enteritis. Louis pursued the same post-mortem work which his tutor pronounced to be essential to progress; but the conditions under which he made his investigations were essentially different. He worked in days of profound peace, and without being shackled by a theory. It is excusable, and perhaps necessary, to quote a few passages from Broussais' "*History of Gastritis and Enteritis*." He writes: "Every diarrhoea which is prolonged beyond thirty days may depend upon the disorganization of the internal membrane of the colon; but in most cases it continues only because it is kept up either by medicines or regimen." He approves of Pina's dietary and medication: "1st, a demulcent regimen, composed of milk and farinaceous substances, and rendered more nourishing in proportion to returning health; 2nd, by mild laxatives, given from time to time; by astringent tonics, given at intervals, associated with sedatives; 4th, by dry air, moderate exercise, the use of generous wine, and tepid baths." A course of treatment in no way resembling the Sangrado practice, which so terrified Gil Blas. The sparse dietary enjoined by Broussais was not absolute, but conditioned on the food procurable, and was justified by results. His conclusions on this subject were based on many autopsies. The following extract from "Chronic Phlegmasiae" are, in this connection, interesting: "In Friuli, the dysenteries were more violent in the same patients than in Holland or Germany. In Istria and Dalmatia they acquired a still higher degree of activity, still in the same patients. Dysentery made the greatest ravages in such of our regi-

ments, as leaving the cold mountains of Carinthia, were sent to Capo d'Istri, or into Dalmatia. The mortality was so great, for some time, that this dysentery might have been thought quite different from that we treated at Udine; nevertheless, it was the same in character.

I conclude from this, first, that the phlogosis was oftener in its highest degree of intensity in these countries than in those in which I practiced medicine." And he gives the experience of M. Chabert, surgeon to the army of Italy, "who saw (in Dalmatia) a small regimental hospital, where dysentery was combated by nothing but rice-water or the solution of gum-arabic. Fatal terminations were rare, whilst patients from the same corps, who entered the (military) hospitals, most frequently perished." Commenting on this, he writes: "But it is not the less true, that the emollient (dietetic) treatment, being from my experience that which abridges dysenteries in the greatest degree." Under the heading "General History of Phlogoses of the Mucous Membrane of the Digestive Passages," he develops his theory. A theory readily accepted of the people; bitterly opposed by his professional brethren; and ultimately universally adopted. The theory was a half-truth, difficult to refute; based, as its author believed, on irrefutable facts; and it has the merit of substituting the affected organ for a hazy concept. The conclusions were drawn from an immense mass of pathological material; but the conclusion had to be drawn quickly and acted on promptly. Napoleon's marshals were not men to brook delay; nor would Broussais have filled in the armies of France, a position of physician second only to that of Dominique Jean Larrey, "Surgeon-General of the Armies of France." The effects of his early training in the arms were noticeable throughout his life. This old militaire, Holmes writes, scolded, bullied, and wrangled with the vigour of Paracelsus; and, we may add, with the success of Knox.

Davy, in his latter years, said, "his greatest discovery was Faraday." So we may say of Broussais, "his greatest discovery was Louis;" and it is to the credit of Louis that he recognized the fact, when he was demolishing the theory of "Irritation," in his immortal work, "Anatomical, Pathological, and Therapeutic Researches upon the Disease known under the name of Gastro-Enterite, Putrid, Adynamie,

Ataxie, or Typhoid Fever, etc., compared with the Common Acute Diseases." The opening sentence of which refers to the anatomical and physiological labours of his former master and friend: "Continued fevers (the typhoid affection) have attracted the attention of physicians of all ages; they may be said to have engrossed it of late, and, it was natural to anticipate, the questions relative to the seat and nature of fevers have been examined by many individuals. Some authors, satisfied with the facts collected by the ancients, have thought that they afforded sufficient proof of the truth of their doctrines; others, relying on observations recently made . . . have viewed fever as a simple gastro-enteritis."

By referring to the list of honours bestowed, it may be easily seen that almost one and all of them were conferred on Broussais after the Restoration, and that with the approval and sympathy of all classes of Frenchmen, which continued unabated until his death in 1838."

HENRY VIIITH AS A PATRON OF MEDICINE.

In the issue of the *Medical Press and Circular* for May 22, 1918, is an article by Dr. Howard B. King of New Orleans, reprinted from the *New York Medical Journal*, describing Henry VIIIth as a broad-minded, just, and sagacious monarch, who, in spite of his great vanity, brutal and vicious desires, sensual tastes, and selfish and fickle religion, was a most liberal and progressive patron of medical science, and was really the originator of the movement which led to the foundation of army and navy medical departments.

"On ascending the English throne in 1509 Henry VIII found the practice of medicine in a chaotic state. There were physicians and apothecaries, master surgeons and barbers, quacks, male and female, all practising medicine in a loose and haphazard fashion. The physicians of the day included a host of empirics and charlatans as well as travelled scholars and men of refined science. The first reform in medicine attempted by Henry was a complete reorganization of the medical service of the English naval forces. Before his reign England possessed nothing worthy of the name of navy. When this great monarch grasped the idea that the power of his kingdom would be best shown in the character of his navy, he laid his plans according to precedent with regard to manning the ships built in his dock-

yards by Italian shipwrights. Until Henry ascended the throne that which best deserved the title of a fighting navy was the flotilla of the Cinque Ports, which rose to importance under the later Saxon kings and Plantagenets. The reign of Edward III, marked by constant warring for the throne of France, brought about a demand for fuller naval organization, which included every seaport of the kingdom. Then the merchant marine of England was impressed for the king's service to transport soldiers, arms and stores to France, and many great sea fights are noted, as that of Sluis, which opened France to the invaders in 1340; Winchelsea, which freed the English coast towns from hostile raids in 1340, and Rochelle, shortly before the retirement of the English army from France in 1372. To be strictly accurate, however, these engagements were fought by land forces embarked in ships which were simply laid alongside the enemy by the mariners. In the Wars of the Roses there was but small need for a navy, but Edward IV prepared for an incursion of France by the same means as Edward III. Edward IV, however, possessed ships of his own, which in peaceful intervals he hired out to traders in much the same manner as did the state of Venice, whose great carriages were frequent visitors of the English and Flemish ports. It is worthy of observation that these Italian craft carried surgeons and a physician as early as 1320. As a surgeon was an absolute necessity during peace times, the same condition obtained during the time of war. That master surgeons accompanied the admiral of the Italian fleet at a very early date may be gleaned from the following: In the library of the Doria Palace at Genoa is a manuscript bearing the date of 1337, wherein is contained an agreement or indenture between Philip de Valois and Anton d'Ovia to furnish forty Genoese galleys, each manned by 210 seamen, among whom there was to be a *barbero* and a *barbieroto*, or a surgeon and his mate; in addition to which it was specially agreed that the admiral should have with him a *maestro di chirurgia* of his own country.

To the really scientific men of the medical profession Henry granted collegiate rights with power to issue licenses to practise medicine and surgery, and to inspect all shops where drugs were stored and sold, which brought the apothecaries legally under their collegiate control and gave them the power, if so moved, to combine the science and art of surgery with the practice of medicine. The surgeons were master surgeons, whose social and professional position rested on their ability, and barbers, who united the practice of minor surgery with a meaner calling, and they alone possessed corporate rights. Henry VIII amalgamated these into one corporate body styled barber surgeons. Apothecaries were members of the City Company of Spicers, now

the Grocers, who then imported the drugs of the Levant. Henry placed them under the control of the physicians. These reforms were begun in 1512 by placing the practice of physics and surgery under ecclesiastical surveillance. At that time it was ordained that all medical practitioners, except those having degrees from Oxford and Cambridge, should be examined by the clergy, assisted by medical graduates or surgical experts in each branch respectively. In the fifth year of Henry's reign, 1513, it was enacted that all barber surgeons should be exempted, as in time out of mind, from bearing arms, and should also be accorded the same privileges as heralds. This exemption, however, was not accorded to the physicians.

In the tenth year of his reign, 1518, he gave to the Royal College of Physicians its first charter. Cardinal Wolsey had much to do with this act of incorporation. This charter meant self-government for the medical profession. Five years later this charter was affirmed by an Act of Parliament. Truly, this must be considered as the act of emancipation of medicine from that Church which had leagued it with astrology and the occult sciences and had degraded surgery to the lowest point.

The need for cultivation of anatomical knowledge was recognized in 1538 by an Act of Parliament legalizing dissection at the Hall of the Barbers. Within the next two years the barbers were incorporated under the name of the Barber Surgeons Company of London, and authorized to pursue the study of anatomy through dissection, in face of the most violent opposition by the Church. To stimulate and encourage the students of anatomy it was enacted that the company "may take annually the corpse of four condemned fellows put to death, to make incision for the better and further knowledge of surgery." It also meant the separation of true surgery from the art of the barber, but enacting that no barber should practise surgery, except the letting of blood and drawing of teeth, and that no surgeon should exercise shaving or other work peculiar to barbers. On the petition of Sir John Gresham, lord mayor, Henry gave in 1547 the building of the dissolved Priory of Canons to the City of London in order that it might be converted into a hospital for lunatics. The great madhouse was known as Bedlam, and was situated in Moorfields, on the south side of what is now Finsbury Square. That Henry VIII should have been so active in medical reforms while engaged in a bitter controversy with the Church of Rome shows him to have been a leader of no ordinary qualities. It was through his efforts that medicine was divorced from the Church. The renaissance of scientific and rational medicine had its origin in the reign of Henry VIII, and it cannot be doubted that this monarch's break with the Church marks an epoch in medical progress.

EXAMINATIONS FOR APPOINTMENT IN THE MEDICAL CORPS OF THE REGULAR ARMY.

The Surgeon-General of the Army announces that preliminary examinations of all eligible applicants for appointment in the Medical Corps, U. S. Army (regular) will be held on March 15, 1920, at various points throughout the United States, in the Philippine Islands, Hawaiian Islands, Panama Canal Zone, Porto Rico, and in France, Germany, and Siberia, of applicants in the military service.

The essential requirements for eligibility to take the examination are that the applicant shall be a citizen of the United States, of good moral character and habits, between twenty-two and thirty-two years of age, a graduate of a medical school legally authorized to confer the degree of Doctor of Medicine, and shall have had at least one year's post-graduate hospital internship.

The requirement that an applicant for appointment in the Regular Medical Corps shall have served at least a year's post-graduate hospital internship, is waived in the cases of those applicants who have satisfactorily served as commissioned officers for a period of at least one year during the World War.

The Government cannot pay any portion of an applicant's expenses incurred in connection with the examination, and in designating the places of examination, due consideration will, therefore, be given to localities from which applications are received, in order to lessen such expenses as far as possible.

The examination will be both physical and professional. The physical examination will be thorough. Candidates who fall below 64 inches in height will be rejected. Each candidate must certify that he labors under no physical deformity or disability which can interfere with the efficient discharge of any duty which may be required. Errors of refraction, if vision is not below 20/100 in either eye, are not causes for rejection, provided they are not accompanied by ocular disease and are entirely corrected by appropriate glasses.

PHYSICAL PROPORTIONS FOR HEIGHT, WEIGHT, AND CHEST MEASUREMENT.

Height 64 inches, weight 128 lbs., chest measurement at expiration 32 in., mobility 2 in.

Height 65 inches, weight 130 lbs., chest measurement at expiration 32 in., mobility 2 in.

Height 66 inches, weight 132 lbs., chest measurement at expiration 32½ in., mobility 2 in.

Height 67 inches, weight 134 lbs., chest measurement at expiration 33 in., mobility 2 in.

Height 68 inches, weight 141 lbs., chest measurement at expiration 33½ in., mobility 2½ in.

Height 69 inches, weight 148 lbs., chest measurement at expiration 33½ in., mobility 2½ in.

Height 70 inches, weight 155 lbs., chest measurement at expiration 34 in., mobility 2½ in.

Height 71 inches weight 162 lbs., chest measurement at expiration 34½ in., mobility 2½ in.

Height 72 inches, weight 169 lbs., chest measurement at expiration 34½ in., mobility 3 in.

Height 73 inches, weight 176 lbs., chest measurement at expiration 35½ in., mobility 3 in.

It is not necessary that the applicant should conform exactly to the figures indicated in the foregoing table. The following variations below standard given in the table are permissible when the applicant is active, has firm muscles, and is evidently vigorous and healthy:

Height 64 in. and under 68 in., chest at expiration 2 in., weight 8 lbs.

Height 68 in. and under 69 in., chest at expiration, 2 in., weight 12 lbs.

Height 69 in. and under 70 in., chest at expiration 2 in., weight 15 lbs.

Height 70 in. and upward, chest at expiration 2 in., weight 20 lbs.

The professional examination will be a written one and will embrace the following subjects: Anatomy, physiology and histology, materia medica and therapeutics, surgery, practice of medicine, obstetrics and gynecology. The minimum passing mark is 80 per cent.

The Medical Corps consists of commissioned officers in number approximately equal to seven for every one thousand of the total number enlisted strength of the Regular Army as authorized from time to time by law, proportionally distributed among the grades and in the ratios as follows: Colonels, 3.16 per cent.; lieutenant-colonels 5.42 per cent.; majors, 23.7 per cent.; captains and first lieutenants, 67.72 per cent.; and two brigadier-generals in addition to the Surgeon-General who holds commission in the grade of major-general.

Original appointments are, as required by law, made in the grade of first lieutenant and while at the present time it is necessary that a first lieutenant serve in that grade for five years before promotion to the grade of captain, legislation has been recommended that the period be reduced to three years. Promotions to the higher grades are made as vacancies occur and all promotions are subject to examination.

To each rank is attached a fixed annual salary which is received in monthly payments and this is increased 10 per cent. for each period of five years' service until the maximum of 40 per cent. is reached. At the present time a first lieutenant receives \$2,000 per annum or \$166.66 monthly; at the end of five years he receives the pay of a captain, \$2,400, with an increase of 10 per cent. after five years' service, making \$2,640, or \$220 per month. After 10 years' service the pay would be \$2,880 annually, or \$240 per month. The pay attached to the rank of major is \$3,000 a year, which, with 10 per cent. added for each five years' service becomes \$3,600 after 10 years' service, \$3,900 after 15 years' service, and \$4,000 after 20 years. The maximum monthly pay of lieutenant-colonel, colonel, and brigadier-general is \$375, \$416.66, and \$500, respectively. Officers, in addition to their pay proper, are furnished with allowance of quarters according to rank, either in kind, or where no suitable Government building is available, by commutation; fuel and light therefor are also provided. When traveling on duty an officer receives mileage for the distance traveled, including the travel performed in joining first station after appointment as first lieutenant. On change of station he is entitled to transportation for professional books and papers and reasonable amount of baggage at Government expense. Groceries and other articles may be purchased from the commissary at about wholesale cost price. Instruments and appliances are furnished for the use of medical officers in the performance of their duties. Well-selected professional libraries are supplied to each hospital, and standard modern publications on medical and surgical subjects, including medical journals, are added from time to time. At each military post there is also a laboratory, and medical officers are encouraged to carry on any special line of professional study which appeals to them and which fits them for their duties as medical officers.

The Medical Department is operating a number of large general hospitals which offer exceptional advantages to medical officers, whose detail to duty in these institutions is made as the exigencies of the service permit so as to afford opportunity for purely professional work along the line of general medical and surgical service as well as the specialties.

Officers of the Medical Corps are entitled to the privilege of retirement after 40 years' service, or at any time for disability incurred in the line of duty. On attaining the age of 64, they are placed on the retired list by operation of law. Retired officers receive three-fourths of the pay of their grade (salary and increase) at the time of retirement.

While the present maximum age limit for appointment in the permanent Medical Corps is fixed at thirty-two years, it is believed probable that by pro-

spective legislation that limit may be modified somewhat in the cases of those applicants who have had military service during the World War, and who are beyond the present age limit. Any such person may, therefore, submit application regardless of his present age, in order that he may be given opportunity for examination, should the suggested change be made prior to March 15, 1920.

Applications should be made in letter form, addressed directly to the Surgeon General, United States Army, Washington, D.C., and should have embodied therein the following data in the order indicated:

- a. Name in full (Initials not acceptable).
- b. Date of birth.
- c. Place of birth.
- d. Permanent home address.
- e. Medical school or schools from which graduated, with date.
- f. Professional experience.
- g. If an officer who has served during the emergency,—complete statement of military service, setting forth (1) the organizations in which served and inclusive dates, (2) present organization if still in service, (3) grade in which originally appointed, (4) present grade if still in the service, (5) date, place of discharge and rank at time of discharge if no longer in the service.
- h. Statement of any service as a contract surgeon in the Medical Reserve Corps, in the Medical Section, Officers' Reserve Corps, or in the Medical Service in Volunteers.
- i. In cases of alien birth, (1) documentary evidence of naturalization, (2) if naturalized through parent, documentary evidence of father's naturalization and sworn statements from two reputable United States citizens establishing relationship between candidate and his father.

Approved applicants will receive an invitation from the Surgeon General, United States Army, to report to the examining board convened at the point nearest to their homes.

At the present time there are, approximately, seven hundred and thirty vacancies in the Medical Corps.

M. W. IRELAND,
Surgeon General, U. S. Army.

NOTICES.

CITY OF BOSTON HEALTH DEPARTMENT.

January 13, 1920.

To Whom it May Concern:—

By the provisions of Chapter 195, Acts of 1919, approved May 29, 1919, all day nurseries operating in cities and towns in the Commonwealth of Massachusetts are required to obtain a license from the local board of health in order to conduct such a day nursery. The Act also provides that the local board of health shall make rules and regulations in accordance with which day nurseries shall be licensed and conducted, and before adopting such rules and regulations the Health Commissioner has arranged to hold a hearing at which persons interested in day nurseries may appear and be heard.

This hearing has been arranged for Wednesday, Jan. 21, 1920, at 2 P.M., in the office of the Health Commissioner, Room 1109A, City Hall Annex, Boston, and you are respectfully invited to attend or to be represented.

S. L. MOLONEY, Secretary.

THE MARY PUTMAN JACOBI FELLOWSHIP.—The Women's Medical Association of New York City offers the Mary Putman Jacobi Fellowship of \$500, available for post-graduate study. It is open to any woman physician for work in any of the medical sciences.

The fellowship will not be awarded by competitive examination, but upon proof of ability and promise of success in the chosen line of work.

Applications for the year 1920-1921 must be in the hands of the Committee on Award by April 1, 1920, and must be accompanied by:

1. Testimonials as to thoroughly good health.
2. Letters as to ability and character.
3. A detailed account of educational qualifications.
4. A statement of the work in which the applicant proposes to engage while holding the fellowship.
5. Examples, if any, of her work, in the form of articles or accounts of investigations which she has carried out.

Two reports will be expected from the holder of the fellowship, one to be presented about the middle of the work and a detailed report for publication upon its completion.

All applications for this fellowship shall be forwarded to the Secretary.

ANGENETTE PARRY, M.D., *Chairman*
ANNIE S. DANIEL, M.D.
MARTHA WOLLSTEIN, M.D.
HELEN BALDWIN, M.D.
ELEANOR TOMES, M.D.
ROSE COHEN, M.D., *Secretary*
151 West 78th St., New York City.

SOCIETY NOTICE.

THE NORFOLK DISTRICT MEDICAL SOCIETY.—A regular meeting of the Society will be held at Masonic Temple, 171 Warren Street, Roxbury, Tuesday, January 27, 8.15 P.M. Telephone Roxbury 56089.

Business.

Communication: "Nature and Treatment of Traumatic Shock," by Walter B. Cannon, M.D.

BRADFORD KENT, *Secretary*.

The Massachusetts Medical Society

TO THOSE WHO PLAN TO ATTEND THE MEETING OF THE AMERICAN MEDICAL ASSOCIATION AT NEW ORLEANS, APRIL 26-30.

In response to a letter from the Secretary of the American Medical Association containing the enclosed clipping from the *Journal* of that Association, the Secretary of the Massachusetts Medical Society would be glad to hear from those Fellows who are planning to attend the New Orleans session, with a view to arranging transportation by boat.

WALTER L. BURRAGE, *Secretary*.

42 Eliot Street, Jamaica Plain, Boston, 30,
January 22, 1920.

TO NEW ORLEANS BY BOAT.

Inquiries received from various parts of the country indicate that a number of physicians would like to make the trip to New Orleans by boat. These prompt the suggestion that physicians conveniently near the Atlantic seaboard and Gulf ports, as well as those at different points along the Mississippi and Ohio rivers, might arrange boat parties which should provide a pleasant and restful journey. It has been suggested further that if boats were chartered to go to New Orleans from different points and were docked there, these "houseboat parties" would provide cool and delightful quarters for those who prefer to stay on the boats during the session.

RECENT DEATH.

DR. S. J. CHONIN, of Roxbury, died recently at the Peter Bent Brigham Hospital as a result of blood poisoning in his left hand.